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ENERGY

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OIL AND GAS

GREATER EFFICIENCY IN USE OF GAS AT TES MOSENERGO

Moscow GAZOVAYA PROMYSHLENNOST in Russian No 4, Apr 85 pp 36-37

[Article by A.V. Muravyov, head inspector, Moscow Regional Inspectorate, USSR Glavgosgaznadzor: "Raise Efficiency of Oil and Gas Consumption at Mosenergo Thermoelectric Power Plants"]

[Text] Providing electricity and steam to industrial enterprises and light and heat to homes are the tasks facing the thermoelectric power plants (TESO of Moscow. As the city continues to grow, the power generating system grows accordingly and new plants are being brought on line.

At the present time, thermoelectric power plants are the largest consumers of gas, burning over 60 percent of all gas consumed. Thus, natural gas consumption at Mosenergo's thermoelectric power plants is being monitored by the Moscow Regional Inspectorate of the USSR Glavgosgaznadzor on a standing basis.

Analysis of technical and economic indicators shows higher utilization of power equipment and increased fuel utilization efficiency, which will undoubtedly lead to a reduction in the consumption of fuel to produce electricity and heat. In 1983, for example, Mosenergo thermoelectric power plants registered a 2.9 g/kW-hr reduction in the proportional consumption of fuel required to produce electricity, resulting in savings of around 165,000 metric tons standard fuel. Taking into account the proportion of gas in the fuel mix at Mosenergo's thermoelectric power plants, annual savings came to over 90 million cubic meters.

At the present time, however, thermoelectric power plants are consuming more fuel than necessary. Results from an investigation of 15 Mosenergo thermoelectric power plants by the Moscow Regional Inspectorate of the USSR Glavgosgaznadzor in 1984 show that due to a deviation in operating equipment parameters from the norm, excessive gas consumption comes to 180 million cubic meters annually, or 1.2 percent.

At many of the thermoelectric power plants, steam and condensate loss is still above the norm.

Effecting savings at the present time is necessary because power generation requires enormous amounts of expensive natural resources which are being depleted. The effort to reduce power generation losses is of primary importance. These losses have a considerable impact on power generation economics.

Suffice it to say, a reduction of only 1 g/kW-hr in Mosenergo's average fuel consumption would yield annual savings of about 60,000 metric tons standard fuel and the capability of generating an additional 200 million kilowatt-hours of power. Faced with limited fuel and energy resources, this additional production of power would represent a corresponding increase in industrial production at relatively little cost.

The Moscow Regional Inspectorate of the USSR Glavgosgaznadzor made inspections of Mosenergo's gas-fired thermoelectric power plants in 1982 and 1984.

Let us look at basic ways to reduce fuel consumption at Mosenergo's thermoelectric power plants.

In the course of the year, a 0.4 percent electric power production increase in the heating cycle was noted which reduced fuel consumption by 0.9 g/kW-hr. As a result there was a saving of about 30 million cubic meters of gas. It should be pointed out that electric power output during the heating cycle in the Mosenergo system as a whole increased while there was a decrease at certain plants (TETs-25) due to the fact that electrical capacity growth is advancing toward the [peak] augmented heat load.

The percentage of electric power generated by highly efficient equipment at 24 and 13 MPa steam power increased to 92.4 percent while power generated by large units (250-300 MW) increased by 1.3 percent. This was achieved by placing new up-to-date units on line and also by modifying equipment load distribution at the plants.

As a result of the implementation of a series of measures aimed at improving equipment reliability and efficiency, and also as a result of performing adjustments and operational experiments, boiler unit efficiency was increased. In a year the weighted average efficiency of boilers in the Mosenergo system improved by 0.1 percent. The performance of power plant shops and adjustment departments was mentioned as well as that of the specialized Mosenergonaladka organization.

In this connection one cannot fail to mention work toward converting boiler units from pulverized coal to gas/fuel oil (TETs 11, 12, 16, 20 and others), which not only raised boiler efficiency but also reduced the city's air pollution level.

One way to increase boiler unit efficiency is to reduce air intake into the convection duct due to low-temperature corrosion of gas ducts and air preheaters, leaks and delayed repair of outer walls. At all electric power plants, repairs were effected to eliminate leaks in boiler gas ducts, repair recycling and tubular air preheaters, and replace or rebuild recycling air preheater seals. As a result, excessive fuel consumption due to excessive air intake was reduced by nearly 2,500 metric tons coal equivalent (about 1.5 million cubic meters of natural gas).

Unfortunately, it must be pointed out that the Taganrogskiy boiler factory, for example, outfits recycling air pre-heaters with pig iron seals. The recycling air preheaters are rebuilt during the first major overhaul of electric power plants by replacing these seals with graphite ones. This greatly reduces air intake into the preheaters.

Due to the accumulation of sediment on the convective heating surface of the boilers, irregular cleaning and excessive air intake into the fire chamber, exhaust gas temperature rises. This reduces boiler efficiency and increases fuel consumption. Therefore, at Mosenergo thermoelectric power plants there is an on-going effort to reduce exhaust gas temperature. In 1983, for example, boilers at TETs 16, 21, 23, 25 and others were shot blasted. Thermal-wave (impulse) cleaning was used to clean the heating surfaces of the recycling air preheaters, and the boiler fire chambers were spray sealed. Due to lower exhaust gas temperatures, excessive fuel consumption for this purpose was reduced by 3,300 metric tons standard fuel (about 1.9 million cubic meters of gas).

In order to increase operational turbine operating efficiency at electric power plants, condenser system tubes were cleaned with a high-pressure "Atyumat" unit. By increasing the vacuum in the turbine condensers, excessive fuel consumption was reduced by 0.1 g/kW-hr on the average, i.e., by almost 3.3 million cubic meters of natural gas.

At the present time, the rebuilding of high-pressure preheaters is almost finished at Mosenergo's thermoelectric power plants. This is being done in order to increase operational reliability. The number of hours of service of high-pressure preheaters increased and the number of shutdowns of individual high-pressure preheater groups in order to repair damaged tube systems and membrane joints was reduced. This, of course, led to an improvement in the efficiency of the recycling feed-water preheaters. Excessive fuel consumption due to higher feed-water temperature was reduced by 27,000 metric tons standard fuel (over 15 million cubic meters of natural gas).

Thus, as a result of improving the technical level of equipment operations, rebuilding and modernization, improving the fuel mix and the structure of power production at Mosenergo's thermoelectric power plants, the average fuel consumption per unit of electric power was reduced. The difference between actual and calculated fuel consumption was reduced by 0.9 g/kW-hr to 4.4 g/kW-hr, which attests to the steady improvement in the efficient utilization of fuel and particularly of natural gas.

In the near future, efforts will be continued to modernize equipment, including the removal of technologically out-dated and physically deteriorated boiler units and turbines (GRES-4 and TETs-11) and the installation and placement in service of new boilers (GRES-4 and TETs-11). At TETs No. 12, the old straight-through boilers will be replaced by a modern boiler unit with an 80-MW turbine. Preparations are under way to convert coal-fired TETs No. 17 to gas.

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OIL AND GAS

TASKS FACING OIL, GAS INDUSTRY IN 1985

Baku AZERBAJDZHANSKOYE NEFTYANOYE KHOZYAYSTVO in Russian No 3, Mar 85 pp 1-4

[Unsigned Article: "Battle Objectives of the Republic's Oil Workers"]

[Excerpts] A meeting of Party and industrial officials was held in Baku on March 2, 1985, to discuss the task of assuring steady oil and gas production in the Republic....

As last year's figures showed, positive results were not achieved in all areas by any means. The Republic's oil production plan was 98.8 percent fulfilled. Azneft Association collectives worked under capacity and fulfilled only 94.9 percent of the plan. It is of special concern that 1984 oil and gas production in the Republic was lower than in 1983.

The last year of the five-year plan began somewhat better. Field organization was better and the performance of personnel in our oil and gas production administrations improved. As a result, the associations achieved 100.3 percent of the oil production plan in January and February. This represents a 5.6 percent increase in oil production compared to the same period last year. The gas production plan was also fulfilled.

Collectives of the CPSU 22nd Congress Oil and Gas Production Association, the Karadagneft, Sal'yanyneft, and Kirovneft oil and gas production administrations, the Bukht Il'ich, Neftyanyye Kamni, Peschaninskiy and Dzharlinskiy drilling associations, and the Kaspar Miraliyev, Adil' Mamedov, Migdat Tairbekov and several other downhole and well workover crews performed well.

The drilling situation also improved somewhat. The Salman Nagiyev, Akif Amanov, Sarkhosh Mamedov, Mamedagi Aliyev, and Eduard Aslanov drilling crews demonstrated a thorough understanding of the tasks ahead and worked selflessly.

It is highly important to increase the production and drilling pace that has been set in order to finish 1985 honorably and make a good head start on the first and following years of the 12th Five-Year Plan. This year the plan calls for producing 8 percent more oil and drilling almost 20 percent more footage than in 1984.

Looking at the state of the industry from this point of view, attendees at the meeting concentrated their attention on shortcomings, malfunctions, disorganization, and poor industrial, organizational and political performance in the collectives. In this regard, the associations' failure to meet the plan for the first four years of the five-year plan was mentioned. Of 16 oil and gas

producing administrations, 12 failed to fulfill the plan. Failure to fulfill oil production and drilling plans is, first of all, a consequence of the low level of industrial, technical and Party leadership and poor labor, industrial and work discipline in many areas throughout the industry. In addition, there are several other weak areas: the slow pace of construction and development of promising fields, unsatisfactory well maintenance, and frequent mechanical failures and drilling breakdowns.

The erratic performance of the Azneft Association is also a cause for serious concern. As is well known, the majority of onshore fields and reservoirs is being depleted, and formation pressures have become quite low. The depletion of onshore wells is advanced and they are low producers. These conditions require painstaking repair of each well and efficient organizational and technical guidelines and procedures. However, this cannot be done on a partial basis. Many specialists and supervisors are tradition-bound and do not encourage crews to use production reserves, scientific and industrial know-how or available financial, material and labor resources. Unfortunately, these areas partially lie outside the scope of the Association's Party organizations.

The performance of the Kaspomorneftegazprom All-Union Production Association largely determines the oil and gas production picture in the Republic. This association produces about 70 percent of the oil and more than 90 percent of the gas. It was noted that recently offshore crews have considerably improved their performance and not only fulfilled the oil production plan, but also increased its growth rate.

However, offshore workers were not able to overcome the shortfall that has been accumulating since the beginning of the five-year plan. The Oil and Gas Production Administration imeni N. Narimanov and the Oil and Gas Production Administration imeni 50th Anniversary of the USSR foresee large shortfalls.

The association's performance improvement should in no way lead to complacency. It must not be forgotten that the Caspian is essentially the basic proving ground for developing offshore oil and gas production equipment and technology.

At the meeting, special attention was given to the problems involved in increasing the efficiency of producing wells and maintaining existing wells in production. For a number of reasons, the main ones being poor technical service, widespread failure to follow technical recommendations, and low efficiency of geological and technical measures and research, hundreds of wells go out of service every year. Even by the most modest estimates, the oil production shortfall due to all of this exceeds tens of thousands of metric tons.

It is of no small concern that the efficiency of measures now being taken to maintain production rates is falling and now averages under 80 percent. At a number of oil and gas associations, it is even lower.

Experience shows that geological and technical measures are sometimes performed without proper justification, and the time has come to lay down formal guidelines. Material and financial resources are not always being expended wisely and are not yielding due results. There are still a number of shortcomings in well workover operations. Due to low service quality, there are

too many breakdowns, instances of deficiency and repeated repair jobs. In many of Azneft's oil and gas associations, a single repair job drags on from year to year, reducing workover crew efficiency. As a result, over 15 percent of the total number of wells is awaiting repairs at any given time.

Speaking of the application of progressive methods to increase oil production, attendees at the meeting noted that at the present time, water is being injected in 68 percent of the total number of producing wells at the Kasporneftegazprom Association and 34 percent of the wells at the Azneft Association in order to maintain reservoir pressure.

The need to further increase production and implement secondary and tertiary production methods has been demonstrated in practice.

Implementation of these measures yields promising results. Thus, in situ combustion at the Artem Island field not only increased production in a number of wells, but even made it possible to produce them by natural flow and pumping. Production of wells at the Siyan-Shor Field, produced by the Kirovneft Oil and Gas Production Administration, and the Umbaki Field, produced by the Kara dagneft Oil and Gas Production Administration, was more than doubled by tertiary production methods. The injection of surfactants has been equally effective. At the Sangachaly-Duvanny fields on Bulla Island, injection of surfactants produced approximately ten thousand additional metric tons of oil per month.

However, these methods are just now coming into use. Field supervisors, specialists, scientists and Party organizations must undertake more initiatives and be more persistent to put secondary and tertiary methods into practice and increase oil production. All these efforts must be carried out on a higher technical and engineering level, incorporating the latest achievements of Soviet and foreign practice.

The meeting stressed drilling as the main way to maintain and further increase oil and gas production. But unfortunately, it is precisely in drilling where shoddy work and shortcuts are most serious. The drilling plan systematically remains unfulfilled and judging by the figures for the first four years of the five-year plan, there will be a sizeable shortfall. Virtually all drilling enterprises are working under capacity.

This is due, first of all, to shortcomings in the supervision of drilling operations and poor labor and work discipline in the collectives. Due to serious failures to observe technical recommendations, drilling remains beset by a high breakdown rate. Seventy percent of failures are directly due to those who perform the work. One tenth of all drilling crews are engaged in repair jobs and a sizeable number of shutdown wells are simply abandoned.

Drilling plans are not being met. Every year the shortfall exceeds 100,000 meters. Productive drilling time comes to slightly over 75 percent, i.e., nearly one fourth of working time is wasted in idleness.

Efforts to achieve high drilling efficiency, reduce equipment failure and drilling downtime, increase drilling penetration rates and improve other technical and economic parameters must be made a cause of concern and unremit-

ting attention on the part of field supervisors, Party committees and local Party organizations. Collectives at drilling organizations and every technical worker must be encouraged to accomplish these tasks.

The pace must not be slackened because prospecting and geological exploration services are performed on a low organizational level and the analysis, evaluation and development of oil and gas fields is slow.

The new Tarsdallyar Field was discovered in September of 1983. A well drilled in this field flowed steadily, producing a large volume of oil. Although nearly 18 months have elapsed, only two new wells have been placed in production in this field. It goes without saying that the tasks currently facing the associations cannot be accomplished at this rate.

Problems in accelerating field construction are equally pressing at the Kasporneftegazprom All-Union Production Association. At the 28 April Field, for example, good results have been obtained on the whole and considerable work has been done. At the same time, many problems remain unresolved, particularly the need to lay another pipeline.

The lag in construction at new fields under development is explained to a considerable extent by poor construction work by departments in the oil and gas production industry. The organization and pace of capital construction in the associations is not meeting field needs. Capital investment plans systematically remain unfulfilled at many construction enterprises. A clearly abnormal situation has become more complicated: construction of field installations, communications facilities, roads, service bases and other facilities is lagging at new fields. This in itself is one of the main reasons for the delay in placing a number of promising fields on stream. It is not uncommon for fields to remain out of production altogether for this reason.

The Azneft Association still is not taking measures to increase the volume or improve the quality of construction or provide departments with needed equipment, machinery and transportation. The construction of a number of important facilities has dragged on for years. Road construction is highly unsatisfactory. The quality of field roads and access roads, especially to exploration wells, is very poor.

Kasporneftegazprom construction organizations systematically fail to meet plans for the construction of offshore platforms. The problem of organizing the repair of platforms, foundation structures and other hydraulic facilities remains critical.

It was also pointed out at the meeting that a considerable part of the transportation fleet is still not being used rationally and idle time is common. As a result, supplies are not delivered on schedule and this in turn causes considerable work downtime at wells, especially exploration wells. Late arrival of workers at job sites and delayed return to the base are common and this also has an adverse effect on normal operations and causes justified complaints by field workers.

Transportation must be better organized, downtime and waiting time caused by drivers must be minimized, and the repair and replacement of vehicles, special equipment and boats must be improved.

Special attention at the meeting was paid to scientists and other scientific research and design personnel.

The industry's institutes should develop a coordinated approach to these problems. Efforts should be concentrated in developing specific proposals to improve field development, increase reservoir productivity and improve the technical and economic aspects of drilling, with special emphasis on improving drilling penetration rates and minimizing breakdowns in drilling.

Scientists must make a definitive reorientation to practical aspects of the oil- and gas-producing industry. Technology is needed that will do more than just meet today's demands, and coordinated technical guidelines are critically needed. Further efforts must be made to reduce manual labor in the oil field.

Development of the Republic's oil- and gas-producing industry, especially in the Caspian Sea, depends on faster solution of many technical retooling problems in oil production and drilling. A number of these problems must also be resolved at the Union level. In addition, there are a number of problems which can and should be resolved locally, at the republic level.

The problem of serious unmet requisitions placed with machine-building, metallurgical, petrochemical and other petroleum-related enterprises remains. Many of these enterprises are handling oilfield problems unsatisfactorily. They are only slowly resolving problems related to the development and manufacture of oilfield and drilling equipment, tools and supplies.

The quality of pipe, bottom-hole and electrical centrifugal pumps, rods and a number of other types of equipment is especially critical. The problem of supplying the industry with high-efficiency for well workover, maintenance and production equipment and tools is being handled unsatisfactorily. The use of this equipment requires considerable heavy manual labor.

Serious complaints were directed at a manufacturer of deep-water foundation structures.

Plans for the manufacture of platforms were not met last year and will not be met this year. As a result, the development of a number of offshore fields is being delayed....

Collectives at industrial enterprises, scientific research and design organizations, local Party organizations, and rayon Party committees are being challenged to develop a broad worker's movement to develop and put into practice modern high-efficiency oil production equipment in short order. That would be an important contribution to accelerating the development of the oil- and gas-producing industry of the Republic and of the country as a whole.

Officials at the meeting discussed living conditions in detail. The Republic Party organization has always attached importance to living conditions. Much has been done in recent years, but much remains to be done.

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OIL AND GAS

NEW PROCEDURES, EQUIPMENT WILL RAISE OIL OUTPUT

Moscow EKONOMICHESKAYA GAZETA in Russian No 32, Aug 85 p 2

[Article: "Progressive Oil Extraction Procedures"]

[Text] As was noted at the April (1985) CPSU Central Committee Plenum, significant renewal of active fixed productive capital must become a priority in the 12th Five-Year Plan.

This conclusion is directly related to the need for reequipping one of the basic sectors of industry--oil extraction--on a modern technical foundation.

Problems concerned with raising the technical level of equipment--chiefly equipment for mechanized oil extraction, and with raising the rate of reequipping of oil fields on the basis of new technology in keeping with the concrete operating conditions are acquiring special significance in the 12th Five-Year Plan. According to calculations made by specialists it would be suitable to significantly increase the fund of oil wells during this period. For the most part their operation will be mechanized. The quantity of injection wells for injecting water into beds will have to be increased by over a time and a half. The proportion of new methods for raising oil yield with respect to total extraction volume will more than double.

With a consideration for this, the efforts of scientific research, design and production collectives will be directed in the forthcoming five-year plan toward improving the quality and operating characteristics of oil field equipment, and chiefly that involved in mechanized oil extraction.

The most important effectiveness indicator of oil equipment is said to be its reliability, which is determined by operating time between repairs.

The longer equipment works without stopping, the more effectively a well is used, and vice versa. At first glance it may seem that it does not take all that much time to repair a single well. But if we consider that there are now tens of thousands of them, the shortfall in oil yield connected with idleness of wells is in the millions of tons. Moreover almost a quarter of the oil extracting enterprises are involved in repairs. Over 300 million rubles are spent each year on such repairs.

Submersible centrifugal electric pumps deserve special attention. For the moment a little more than 20 percent of the wells are equipped with them. But they are responsible for extraction of 40 percent of all oil and over 57 percent of all reservoir fluids. Moreover the number of such wells is to be increased by a factor of 1.7 in the 12th Five-Year Plan.

In 1981-1984 the working time of wells equipped with submersible centrifugal electric pumps between repairs was increased by 33 percent. But the level planned for this indicator has not yet been attained. As a result over 4,000 additional underground repairs had to be carried out. The losses in oil extraction due to idleness of wells equipped with submersible centrifugal electric pumps down for repairs totaled 330,000 tons.

The current supply cable is the weak link of the submersible centrifugal electric pump. It often malfunctions with its first lowering into the well. Such a cable cannot be restored.

The Soyuzelektrokabel' All-Union Production Association must consider that its products do not yet satisfy the operating requirements of the oil fields in terms of heat resistance and structure. The association basically supplies flat cable, which is less dependable than round cable, especially in slanted wells.

There are plans for significantly raising the technical level of submersible centrifugal electric pumps in 1986-1990. For example, series production of cable that is to work at temperatures up to $+160^{\circ}$ is to be initiated. In compliance with the demands of the oilmen, 70 percent of all supplied cable will be round. Production of pumps with a corrosion-resistant design is to be increased by a factor of 2.4.

Manufacture of submersible centrifugal electric pumps intended for work with oil containing a higher gas concentration will begin right this very year. This is extremely important to oil fields of West Siberia and the Komi ASSR. Owing to these and other measures, the guaranteed time of work of the pumps without removal from wells will be increased by not less than 50 days.

Series production of submersible diaphragm electric pumps for oil extraction from so-called sand-flow wells is to be organized in 1986. There are many such wells in Azerbaijan, in Turkmenistan and in Mangyshlak Oblast. The oil well sucker-rod pumps presently in use break down quickly. Their replacement by diaphragm wells just in the Azneft' Association alone will make it possible to double or triple the between-repair operating time of wells yielding sand together with their products, and to obtain more than 20,000 tons of additional oil per year.

About 60 percent of the mechanized wells are being operated with deep sucker-rod pumps. On the average each such well is repaired 3 to 4 times a year. The preconditions for lengthening the time between repairs have been created. Wide introduction of bushing-free pumps has begun. They are more reliable during work and during transportation, their overall dimensions are the same as those of pumps with bushings, their discharge is greater, and they are built with less metal.

In cooperation with producers, Soviet scientists have developed a so-called long-stroke deep pump for raising liquid from wells. It is unique in that the sucker-rod string consisting of individual threaded units is substituted by a high-strength belt that is continually wound onto a drum as the traction element. This design increases the well operating time between repairs by a factor of 1.5-2, and it halves the operating expenses. Next year tests on an experimental lot of these devices will begin.

Introduction of the gas lift method of well operation was begun in West Siberia in the current five-year plan.

This method differs fundamentally from those described above in that the liquid is raised not by a pump but rather by gas which supports the liquid and carries it to the surface. The work of replacing the well equipment is being carried on chiefly with the assistance of cable equipment, without the need for stopping the wells.

Gas lift technology is especially effective in new oil extraction regions. The reason for this lies mainly in the decrease in laboriousness of servicing the wells. The relative number of personnel servicing one such well is 40 percent lower than for a well equipped with a sucker-rod pump, and 34 percent lower than for a well equipped with a submersible centrifugal electric pump.

Oil deposits containing significant quantities of hydrogen sulfide and carbon dioxide and having abnormally high reservoir pressure have been discovered in recent years. Their exploitation requires organization of the production of special highly reliable equipment, instruments and apparatus capable of working in a highly caustic medium. It is with this purpose that series manufacture of the necessary technical resources is to begin in 1986. Such equipment includes, in particular, Christmas trees, wellhead equipment and blowout preventer equipment capable of withstanding a working pressure of 700 atmospheres, machinery to support cable operations in wells up to 5,000 meters deep, and a complex of instruments for the unified deposit control and safe operation system.

Raising the oil yield of the beds has become one of the main problems in petroleum industry.

The problem is that many new oil reserves have been discovered in recent years in deposits characterized by low productivity and complex structure. Traditional methods of their development are unacceptable. Fuller extraction of oil from considerably flooded highly productive beds--ones which have been in operation for a long time but which still contain significant reserves--has also become an urgent problem.

An effort is being conducted here and abroad to create effective procedures for developing such reserves using physicochemical, thermal and other methods. These methods essentially entail creation of conditions in productive beds for their better exploitation and for more-intensive flow of oil to wells. These procedures require special technical resources and chemical products, which makes them more complex and expensive. Each of these methods has a certain area of application in which it is the most effective. Their introduction

makes it possible to raise the oil yield by 10 percent and more, and provides a possibility for extracting tens of millions of tons of additional oil.

Experimental and experimental-industrial projects involving the new procedures are being carried on today in most of the oil extracting regions. Forty-eight sector and academy scientific institutions and design organizations, and six plants of the machine building ministries are participating in this work.

There are plans for significantly expanding introduction of the new procedures. To support this, we would need to begin producing a complex of equipment for injecting special substances into beds, and we would need to create capacities producing the necessary chemical products. A specific-purpose integrated scientific-technical program for raising the oil yield of the beds has been drafted.

New procedures for controlling salt and paraffin deposits based on the use of special chemical reagents acting as inhibitors have been created. Inhibitors are introduced both directly into wells, and, when necessary, into the systems for collecting and preparing the oil and for maintaining reservoir pressure. Owing to exclusion of well stoppages due to deposition of salts, the time of their work between repairs is being increased by a factor of 1.5-2. There are plans for increasing the quantity of wells processed with paraffin deposition inhibitors by a time and a half. This will make it possible to stabilize oil extraction from such wells, and to increase their working time between repairs to the level of normal operation.

The scale of development of petroleum and further advance of oil fields into inaccessible regions produce a need for accelerated automation of production processes.

Unfortunately for a number of reasons the effort to solve the new problems in this area was too slow in recent years. Development of modern sensors of various kinds, measuring devices and automation resources fell behind. Record keeping on oil extraction in the primary producers--the brigade collectives--and of the volume of water injection to maintain reservoir pressure has not been organized in all places. And yet, just prompt detection of well stoppages and adoption of the appropriate operational measures would make it possible to extract several million tons of additional oil per year.

The UkgiproNIIneft' Institute has created the TMS-3--the so-called thermomanometric system; its principle of operation entails transformation of well pressure indicators in the presence of well suction and electric motor temperature into a frequency signal transmitted via power cable to the surface. When a deviation occurs from the prescribed operating conditions, the device switches off. It is turned on automatically. Tests on the system in the Tatneft' Association demonstrated its high effectiveness.

Series manufacture of TMS-3 systems will begin in 1986. By equipping submersible centrifugal electric pumps with them, we can get the pumps working without participation of service personnel, and create conditions for remote control.

Initiation of production of a multilevel system for controlling oil field installations--wells, well clusters and booster and cluster pumping stations--on the basis of microprocessor technology is also foreseen in the 12th Five-Year Plan. Resources for monitoring the oil, gas and water yield without separation, outfits of instruments to monitor and control group measuring devices, devices for oil field and brigade oil and gas accounting, well product delivery signaling systems and others will be developed and placed into operation.

Implementation of the planned measures for increasing production of oil field equipment, raising its technical level, achieving wider use of new procedures and technical resources and automating production will create the conditions for hastening scientific-technical progress in petroleum industry and for intensifying oil extraction.

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OIL AND GAS

POWER FAILURES, OTHER PROBLEMS IN TYUMEN OIL FIELDS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA In Russian 7 Aug 85 p 2

[Article by Yu. Belanov and V. Kremer, special correspondents in Moscow and Tyumen: "Oilfield Difficulties"]

[Text] For the third straight year, Glavtyumenneftegaz is not meeting the State plan. In the last seven months, the shortfall is over 15 million metric tons. It is not difficult to imagine how important this shortfall is for the national economy. These 15 million missing metric tons were used in planning figures serving as the basis for the country's fuel and power reserves.

What happened? We asked this question at the offices of the Ministry of the Oil Industry and at the fields thousands of kilometers from Moscow where the fate of five-year plans for oil is decided. The specialists generally agree on the reason. They told us that the shortfall was not a surprise. Oilfield workers were unable to cope with the new, more complex phase in the development of the Western Siberian complex, where oil no longer flows naturally, but must be extracted from the depths of the earth in the fullest sense of the word. This is a phase, we might point out, in the development of any oil field which is as inevitable as the change of the seasons.

Of course, it is easy today to point out the errors of the past: they are in full view. It is also quite proper that almost everyone we interviewed talked not so much about what was omitted and left undone as they did about how things must be done now and made up for.

The deputy minister of the oil industry, V. Greyfer, who is the director of Glavtyumenneftegaz, said that the development of 11 new fields is planned this year. Eight have already begun producing. To be sure, their production is expected to be comparatively low in the near term, about a million metric tons. But these new fields will produce tens of millions of metric tons of oil in the next five-year plan. This will significantly reduce the load on Samotlor and other well-known fields.

We studied the operational report on progress at new facilities. Roads, power transmission lines and pipelines are being built to these facilities. Drillers and rig builders will be assigned to these new facilities. Drilling figures must be doubled next year.

Changes were obvious in the brigades at Glavtyumenneftegaz. The process of beefing up technical and engineering services, which had remained minimal while the wells flowed naturally, had already begun. A central technical and engineering department was organized and it receives all current production data.

It was necessary to bring in experienced personnel. Not all supervisors understood that it no longer suffices merely to have reserves: one must know how to produce these reserves. One of these was N. Sergeyev, director of one of the leading Samotlor administrations, Nizhnevartovskneft. For several years, he consistently questioned the need to convert wells to the modern gas lift production method, arguing whether this would really increase production. And when the new leadership in the main administration asked the Nizhnevartovskneftestroy Trust to give first priority to the installation of gas lift equipment and a hundred wells were completed in a month's time, the field workers, having grown unaccustomed to this equipment, were taken by surprise. This led to serious losses.

A new director is now in charge of the Nizhnevartovsk Administration. The order dismissing N. Sergeyev from his position read, "Dismiss for failure to take proper measures to increase oil production and misrepresentation of the facts." A harsh explanation. But apparently, people's attitudes cannot be turned around and deeds cannot be brought in line with words without such drastic measures.

Organizational and psychological readjustment is required, of course, and one would like to think that this readjustment will be positively reflected in results. But a shortfall of 15 million metric tons cannot be ignored. This oil is needed today. And the lag by Tyumen oilfield workers, rather than improving, is worsening. A graph of daily production rises and plunges erratically around the base line.

"How could it help but be erratic?" asks V. Kudrin, director of Glavtyumenneftegaz's Oil Production Administration. "A day never goes by without a power failure. When the power is out, the wells, pump stations and drilling rigs stand idle."

Two serious power outages, one right after the other, knocked out oilfield operations in the last few days in July. Total losses directly attributable to power failures amount to 340.800 metric tons of oil so far this year. This is a considerable amount, but only two or three percent of the shortfall. This is not the main reason for failure to meet the plan.

At Samotlor Cluster No. 666, we got to know a senior operator in a downhole service brigade, Umar Khugaliyev, who came to the Ob River area from the city of Groznyy. He had just finished running a new submersible electric pump in a well. The well had only to be tied into the field gathering line and it would start to produce oil. But the young operator was not satisfied.

"No big deal," says Umar angrily. "We put one well on stream, but another well goes out. We do repairs for the sake of repair. Who needs work like that?"

In the Tyumen fields, for one reason or another, one out of every five wells is idle. It has been calculated that if the 2,570 wells now out of service were

placed on stream, over ten million metric tons of oil could be produced by the end of the year, i.e., two thirds of the current shortfall. This is the most promising approach. It's there for the taking!

But the taking is not so simple. The service brigades, which already outnumber production crews by two and a half to one, cannot place these wells back in service in time. Oilfield workers from Groznyy, Baku, Kuybyshev, Krasnodar, Al'met'evsk, Ufa, etc., have come in to help the Tyumen workers at this difficult time.

Special Aeroflot flights are bringing flying brigades to cities in Siberia day and night. Over 50,000 production and drilling hands are now living and working on a schedule calling for two weeks in the North alternating with two weeks at home. These workers are handling 35 to 40 percent of all drilling operations and about 25% of well servicing operations. Their assistance has become indispensable: of this there can be no doubt.

The shift method does not come cheap. This is all the more reason to ensure that this assistance is efficient.

When Nizhnevartovsk's 150 service brigades were swelled by a hundred new arrivals, problems were bound to arise.

We attended an assignment meeting at Nizhnevartovskneftegaz, the country's largest petroleum enterprise. General Director L. Filimonov was reviewing reports about the work done by the out-of-town collectives in the last 24 hours. The Belozerneft Administration could not dispatch two brigades of Kirghiz servicemen to the field because no vehicles were available for that shift. At the Priobneft Administration, field hands from Perm and Stavropol were idled for 68 hours because special equipment was unavailable. Udmurt and Nizhnevolga workers waited 17 hours for drilling mud. Total downtime for the outside brigades came to over 500 hours for the day.

One hears these unpleasant reports and reluctantly comes to the conclusion that the workers sent to Tyumen have not been handled responsibly. It would seem that someone sent workers off in all directions without tools; some have tools, but they have one foot in the grave, as the saying goes. Nizhnevartovsk workers had to provide some tools and winches to the newly arrived brigades. Every set of tools was accounted for.

A hundred brigades mean over 2,000 men. They have to be trained, fed, housed, transported and provided with everything needed to do their work efficiently. One can imagine how much this burdened those in the association who are responsible for organizing the out-of-town brigades.

"Not long ago at Samotlor we were checking the work done on the night shift by Azneft workers," said Personnel Director V. Aliyev. "It was looking pretty bad, I'll tell you straight off. For instance, we went into Foreman Zagorskiy's quarters. The shift was asleep. We woke up the rig helper and asked him, 'Why aren't you pulling the tubing?' 'Because there is no one to operate the winch.' And the next brigade was also all asleep: they had a man on the winch, but the tubing had not been delivered...."

The 100 service brigades assigned by order of the Ministry of the Oil Industry did not actually increase oil production. Moreover, the number of idle wells was greater on July 1 than it was on January 1.

The problem, apparently, is not limited to allocating the sector's labor resources to assist a promising region. With more and more "flying brigades," these problems can only be ironed out with time. And the expeditionary/second shift method also has its limitations.

In the initial phase of development, Western Siberia was a unique proving ground where many technical and engineering innovations in oil production were first tested under working conditions and became generally accepted. To a large extent, this is how it was possible to start literally from scratch and set up a huge fuel and power complex in such a short time frame. However, it must be admitted that over the last few years, the innovators' pioneering tradition has been largely lost, even though innovations based on scientific and technical breakthroughs are perhaps needed now more than ever before.

We were shown an interesting innovation at the Surgutneftegaz Association: a hydraulic plunger pump. The experimental prototype ran for almost 900 hours, almost twice as long as the widely used submersible electric pumps. "If we had more pumps like these, we wouldn't know what service problems are," said V. Bogdanov, general director of the association. "But what are the chances that they will be mass produced? For the moment, we have only indefinite promises."

This newspaper has already written about how field equipment is not up to present-day requirements. This is not to be blamed on just a few machine builders. The purchaser must also accept some of the blame. The Ministry of the Oil Industry, as noted at a recent expanded board meeting, is not backing up its technical retooling of the sector's enterprises with the required persistence and follow-up. Siberians are feeling this particularly acutely. On the whole, there is a complete break between oil-producing installations and the scientific and technical facilities needed to maintain current levels and further improve production.

Judging by reports, over 70 percent of Tyumen oil is produced at automated fields. Upon closer inspection, however, the actual figure is far less. Less than one-third of the producing wells are tied into the remote-controlled system. And by no means can instrument readings always be fully trusted: the automated equipment is unreliable and often fails.

A signal from a satellite metering battery appears on the display screen, which is monitored around the clock by an operator. As many as ten wells are tied in to each such satellite. If some unforeseen failure occurs, say, a break in the line to the electric pump, the operator does not know which well has stopped producing. How is it possible, we were asked, to obtain maximum production from every well if the wells are not monitored individually?

The oil-producing province in the North measures tens of square kilometers of marshy taiga. In the winter, well access is not difficult, but in the summer,

some well clusters cannot be reached: they are surrounded by water. Under these unusual conditions, only automated equipment can provide answers to the most basic questions, such as: How much oil was produced by the shift? How much was produced per day? Without this information, operations are carried on in the dark, almost by feel, as it were. Out of a total of 212 brigades at Glavtyumenneftegaz, 130 work without oil production figures. When field hands in the older fields are told about this, they don't believe it.

The proportion of reservoirs where the oil is difficult to produce is increasing in Siberia. Basically, the easy oil has already been recovered. Less productive formations remain, presenting far more complex geological structures. But how can these natural resources be exploited if the industry's available know-how cannot devise efficient development plans and projects? Even at Samotlor, reservoirs of hard-to-produce oil remain untouched to this day.

Individual experiments also included well-known new recovery-enhancement methods, since these methods may be the most advantageous. According to the specialists' figures, increasing Tyumen oil production by only two to three percent (which, it might be noted, is quite realistic) would yield tens of millions of metric tons of additional oil. This is worth fighting for!

This new phase of development of the country's main oil-producing area has indeed created a number of complex problems. Ever so, there are grounds for concluding this article on an optimistic note.

At the Nizhnevartovskneftegaz Association, we saw some fast improvement: the Belozerneft Administration and the Chernogorneft Administration met the daily production plan. The Var'yeganneft Administration, one of the farthest behind, increased oil production by 1,000 metric tons a day. Collectives at the Yunganskneftegaz and Surgutneftegaz associations are ahead of plan. This is encouraging.

But of course, the problem of Tyumen's hard-to-recover oil remains and must be solved. Its solution will require the entire arsenal of scientific and technical breakthroughs. Now there is no other way.

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OIL AND GAS

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'TURNKEY' WELL CONSTRUCTION--A MEANS OF INTENSIFYING CLUSTER DRILLING

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 4, Apr 85 pp 23-27

IVANIV, M.I., Ivano-Frankovskoye Drilling Administration

[Abstract] In July 1983 an experiment in turnkey construction of oil-well clusters was instituted for UBR's [Drilling Administrations] operating on the watch-expedition method at Glavtyumenneftegaz oilfields in Western Siberia. The Ivano-Frankovskoye UBR, active in the area since 1979, was one of the first to participate. Under the turnkey method, the UBR handles all work after the exploratory drilling is completed and until the well cluster is handed over to the NGDU [Oil-and-Gas Production Administration]. This includes site preparation, drilling rig installation, well cluster drilling, completion, hookup, cleaning the site and presenting the completed clusters to the NGDU. The UBR formed a new subdivision: the shop for the testing and operating preparation of well clusters, made up of five brigades which clean-up the site after the clusters are drilled, complete and hookup the well clusters and prepare the final documentation. Regulations for Interrelations Between URB Subdivisions were adopted. These stipulate the obligations of the production department of the deep exploratory drilling expedition, the derrick installation brigade, the drilling brigade and the shop for the testing and operating preparation of well clusters. In 1984, workers were put on a 30-day cycle for maximum efficiency: fifteen 12-hour work days, 2 days for transportation to and from their permanent homes and 13 days rest. In all cases, a third watch, brigade or link remains at the workplace to ensure continuous operation. The turnkey system has enabled the Ivano-Frankovskoye UBR to increase its annual total running meters drilled, increase its percentage of productive time and reduce the average time needed to make a single well.
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GAS INDUSTRY OBLIGATIONS AND TASKS

Natural-Gas Industry Challenges

Moscow GAZOVAYA PROMYSHLENNOST in Russian No 3, Mar 85 p 1-2

[Excerpts] The 1985 Socialist Obligations of the Worker Collectives of the Ministry of the Natural Gas Industry

In carrying out the decisions of the 26th Congress of the CPSU and subsequent Central Committee Plenums, the worker collectives of the natural gas industry have punctually fulfilled their plans for natural gas production and their socialist obligations for 1984 and the four years of the five-year period.

In 1984, the national economy received 9 billion cubic meters of natural gas more than the plan called for and the greatest increment of natural gas production exceeded 51 billion cubic meters. Worker productivity exceeded planning by 2.3 percent while production costs were lowered by 3.6 percent more than the plan. The Urengoy-Center 1 pipeline went into operation on time. Obligations to open new housing and other living and cultural facilities were fulfilled.

The natural gas industry must now, on the basis of an increase in the creative activity of workers and more efficient use of existing and more quickly activated facilities for the production, processing and transportation of natural gas, increased work on the introduction of scientific and technical innovations, greater worker responsibility and discipline, complete ahead of schedule (5 December) its tasks of the 11th five-year period and on 29 December fulfill the yearly plan on natural gas production and other important technical and economic indicators was also completed. The national economy must also be provided an additional 44 billion cubic meters of natural gas, four billion of which are above the plan of the final year of the five-year period. The industry must also over-fulfill its task to increase labor productivity by one percent and reduce production costs another 0.5 percent below the planned reduction.

By improving the working conditions in mines, gas-processing plants and gas pipelines, the introduction of resource-saving technology, reducing above-normal stocks and nonproductive losses, the natural gas industry must save 130 million kilowatt-hours of electrical energy and 125,000 gigacalories of

thermal energy, 4000 tons of rolled metal and pipes, 200 tons of turbine oil and 1500 tons of chemical reagents. Every worker collective must also establish a fund of saved materials and resources and be able to work two days per year using the materials, fuel and raw materials saved.

The nation's unified single system of natural gas supply must be made more reliable and efficient. Pumping stations with new modular automated 16- and 25-kW pumps must be started up ahead of time. Technological discipline must be increased, the volume of repair work must be raised. The quality of repair work and preventive maintenance of equipment and the linear parts of gas pipelines must be improved. For gas-pumping aggregates, this can extend the period of service between overhauls by two percent. About 670 kilometers of gas pipelines to and from electrical power plants must be built. This measure can save 12 million tons of fuel oil per year.

Workers must be active in the execution of measures to introduce new technology and equipment, automation and mechanization of industry and to achieve an additional savings of 80 million rubles, including 65 million from realization of the proposals inventors and efficiency experts.

The natural gas industry's plants must produce one million rubles worth of consumer goods above and beyond the plan and increase by 5 percent the production of gas stoves with the state seal of quality.

To consistently carry out the program for social development of the industry, it is necessary to open 970,000 square meters of new housing, places in preschools for 5000 more children and 3800 places for pupils in general schools. Still other new public facilities and housing must be built. The efficiency of state and secondary farms along with that of natural gas industry plants and organizations. There must be a 6-percent increase in the production of meat, 190-percent increase in grain and 120-percent increase in fruit.

The professional skills of the industry's workers must be raised, 27,500 workers must be taught new professions and the qualifications of 75,000 persons must be improved

The workers of the natural-gas industry challenge builders, assemblers, machine builders and transport workers everywhere to work constantly during the current five-year period to activate ahead of time mines in the Urengoy and Yamburg deposits and to complete the Yamburg-Yelets natural gas pipeline.

Details of Gas Industry Obligations for 1985

Moscow GAZOVAYA PROMYSHLENNOST in Russian No 3, Mar 85 pp 3-7

[Excerpts] In January 1985, an expanded session of the collegium of the Ministry of Natural Gas Industries and the Central Committee of the Petroleum and Gas Industry Workers' Trade Union was held. This meeting reviewed the tasks to be carried out by worker collectives and the industry's organizations in order to execute the 1985 state plan for

economic and social development of this industry in light of the CPSU Central Committee Politburo decisions made on 15 November 1984 and the directives and recommendations contained in the speech made by Secretary General of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet K.U. Chernenko.

Since the start of the five-year period, the national economy has received 35.1 million cubic meters of gas above and beyond the amount called for in the plan. The pace of growth of industrial production exceeded 29 percent against the level of 26.3 percent stipulated by the plan. Worker productivity increased 21 percent as opposed to the 18.3-percent increase of the five-year plan.

In 1984, the USSR produced 9.4 billion more cubic meters of natural gas than planned. This was a record gain of 51.6 billion cubic meters in natural gas production and this was 150 percent higher than the figure set for the preceding year.

Plans for the production of sulfur, condensed gas, unstable gaseous benzene, helium, ethane and other by products were fulfilled.

The machine building plants produced 2.5 million gas plates, 18 million rubles worth of spare parts for gas pumping equipment and 99.3 million rubles worth of consumer goods (5.2 million rubles above plan).

In 1984, the capital investment plan was 105.3 percent fulfilled while construction projects were 120.8 percent fulfilled.

A decisive contribution to the high rate of the industry's growth was made by the gas industry workers of Western Siberia. For four years, the level of production of Tyumen natural gas has risen sharply. The mines of the Tyumen oblast have early achieved a daily level of gas production of 1 billion cubic meters.

The Karachaganak deposit in Western Siberia has begun to undergo industrial exploitation. The Astrakhan deposit, the Sovetobad deposit in the Turkmen Republic, the Shurtan deposit in Uzbekistan as well as new gas and petroleum deposits in other regions are being built up.

The Urengoy-Center 1 pipeline has been connected to the Single natural gas supply network. The construction of pumping stations on the Urengoy-Uzhgorod, Yelets-Kursk-Dikanka, Shebelinka-Krivoy Rog-Izmail and Minsk-Gomel pipelines has been completed. Large thermal electrical power plants substituting natural gas for fuel oil have been built along with 13 pipelines.

An extensive complex of measures has been taken to improve the performance of gas industry facilities. Underground storage reservoirs have now received more natural gas than planned.

Plans and socialist obligations on the realization of programs for social development of the gas industry have been realized: 935,000 square meters of

living space have been opened, hospitals have received 672 new beds and medical clinics have been expanded to care for an additional 920 patients while 11,000 places in general education schools and 4800 places in preschool establishments have been opened.

The results of the work of the gas industry in 1984 attests to the fact that a good foundation has been laid for successful implementation of this year's tasks and of the five-year period in general.

In connection with this, it must be mentioned that individual associations and plants have allowed themselves to fall behind. For example, the Komi Gas Industry Association did not meet its plan for gas and condensate production while the Caspian Gas and Petroleum, Tyumen Gas and Turkmen Gas associations are behind in their condensate production and the Soyuz Uzbek Gas Industry Association is lagging in its natural gas production.

Many plants working on supply contracts have not met their obligations. These include the machine tool plants of the Soyuz Gas Machinery and Apparatus and Soyuz Gas Machinery Repair associations.

Not all plants have achieved their planned indicators for worker productivity. In general, drilling plans have only been 92.2 percent fulfilled.

It was stated by the collegium that a characteristic feature of the 1985 state plan for economic and social development of the gas industry is maintenance of the achieved high increment in production of gas with a simultaneous sharp increase in the production of petroleum and condensate. The volume of overall gas production in the Soviet Union has exceeded the five-year plan's quotas by 2.2 billion cubic meters. The plan called for the production of 1,565,000 tons of sulfur, 780,000 tons of condensed gas, 208,000 tons of ethane and a considerable quantity of gaseous benzene. The production of consumer goods has been set at a level of 101.6 million rubles.

In four years, industrial production is supposed to go up 9.8 percent at an annual rate of 6.5 percent. Worker productivity should increase by 6.6 percent.

In 1985, about 10.7 million rubles of capital investment should be introduced along with 5.6 million rubles of construction and assembly work: 2.5 million meters of shafts will be drilled, hundreds of new wells will go into operation, a series of installations for large-scale processing of gas and petroleum will go into operation along with more than 9000 kilometers of gas pipelines and 58 pumping stations and the active capacity of underground reservoirs is to be increased.

The main efforts of the central ministry, association collectives and plants should be concentrated first of all on the resolution of large-scale key problems crucial to the outcome of the plan. These include bringing up to their rated outputs the Urengoy, Sovetobad and Shurtan deposits, increasing the volume of condensate production by the activation of the Urengoy Gas Condensate Complex and further assimilation of capacities at the Karachaganak deposit. Petroleum production is to be accelerated by the opening of the

Deposit imeni 28 April on the Caspian Sea shelf and the completion of construction of the Urengoy-Center II pipeline in the second quarter of the current year.

For successful realization of the plan, a series of organizational and technical measures have been worked out. These are aimed at involving greater reserves for increasing production efficiency and worker productivity, making fuller use of created funds and more economical use of all resources, the introduction of the latest achievements of science and technology, accelerated introduction of new capacities, housing and public facilities.

The collegium has devoted special attention to tasks that must be solved in the chief gas-producing regions. In particular, Western Siberia must activate certain facilities of the Urengoy Gas Condensation Complex, hasten the construction of wells and mining equipment and fulfill its assignments in the provision of petroleum from petroleum trimmings, intensify its work to build up the Yamburg deposit and begin preparation and experimental production of petroleum from the Novoportovsk deposit.

In 1985, the collective of the Orenburg Gas Industry Association will have to perform a large amount of overhaul work at its gas processing plant, not only fulfill but over-fulfill all tasks in the production of natural gas and condensate and of natural gas products. Special attention must be given to construction of the Ashkhabad Complex and the production of condensate at the Karachaganak deposit. In May it will be necessary to complete construction of the second line of the Karachaganak-Orenburg condensate pipeline, build main pumping stations and sharply increase the level of the organization of drilling. Drilling must also be improved, road construction accelerated and the industrial base and the system of water and power supply must be expanded.

At the Turkmen Gas Industry Association, more intensive work must be carried out to open up the Sovetabad deposit, start up two installations for large-scale processing of gas and complete the construction of power plants.

It has become necessary to bring into operation cooling installations at the Shatlyk deposit and compressor stations at the Kirpichli and Naip deposits.

Last year, the workers of the Soyuz Uzbek Gas Industry Association carried out a great deal of work to restore the Mines imeni City of Gazli. Much was done to standardize the work of the Murabek gas-processing plant. Along with this, the plant's work includes some serious omissions such as low technological discipline, poor organization of production and a high rate of employee turnover. To improve the state of affairs at the association, the collegium of the Ministry of Gas Industry has approved some principal measures to intensify overhaul work, reconstruct of installations and equipment at the plant, improve living conditions, trade and the food of the inhabitants of the city of Murabek. To hasten the introduction of new facilities to the Shurtan deposit, schedules were developed for construction and introduction of sulfur-removal equipment and other equipment for many mines there.

This year, the plants of the Caspian Sea Petroleum and Gas Industry Association have a very concise plan. Along with the introduction of new

capacities, they must start work to maintain sheet pressure at deposits with falling natural gas output, improve equipment and technology for lifting gas from wells and convert low-yield wells to deep pumping.

The collegium stated that due to poorly-timed preparation of wells and operations, a necessary fund has not been established at the Urengoy, Karachaganak, Astrakhan, Sovetabad and Shurtan deposits, i.e., at the deposits that are crucial to the success of the plan.

In 1984, drilling plans were not fulfilled by 9 associations. The volume of exploratory drilling and commercial speeds among the ministry and leading associations was lower than in 1983 and the balance of calendar time was also worse.

Among the reasons for poor implementation of drilling plans are poor organization of the work of the basic and auxiliary shops at the Tyumen Gas Industry Association, poor labor and technological discipline at the drilling plants of the Astrakhan Gas Industry Association and breakdowns and malfunctions in drilling organizations of the Main Marine Petroleum and Natural Gas Production Association.

The main cause for the poor quality of drilling is the little attention given this by association directors who are not building up their drilling base, road system or electrical power networks for drilling. The high rate of worker turnover is also to blame. Technical re-equipment is proceeding very slowly. Insufficient use is being made of highly-efficient types of drill bits, large spiral face motors, standardized modular drilling tower stands, modular boxes for drilling equipment and space for removal of drilling solvents. It must also be said that little use is being made of progressive technological processes.

The experience of leaders has not been applied on any broad scale. At the beginning of 1984, the brigades led by A.I. Glinyanov and G.A. Sidorov at the Tyumen association which has in recent years achieved high indicators at the Urengoy deposit have come forth with a valuable initiative to drill 25,000 m of shafts in a year, but this never came about because the collectives could not keep their schedule.

The associations' leaders should establish some form of systematic control over the construction of wells and the observance of technological and production discipline requirements, improve the organization of drilling, hold those who do the work more responsible for its outcome and force through the construction of production bases and housing for drilling crews.

The regulation of drilling should most of all improve its performance, raise its technical level and introduce advanced technology and progressive methods for the organization of labor and drilling.

The Main Marine Petroleum and Natural Gas Association must achieve a substantial improvement of the technical and economic indicators for drilling, especially on marine shelves, increase the efficiency of the work of floating drill platforms and give more attention to expanding the base for their maintenance.

There has been considerable success in increasing the output of the Unified system of gas supply and its performance has been much improved. More than 34,000 kilometers of natural gas pipelines and 240 compressor stations were built during the first four years of the five-year period and by the beginning of 1985 the overall length of these lines had reached 159,000 kilometers.

In 1984, in order to provide reliable and efficient operation of their pipeline systems, the associations carried out a large amount of planned preventive maintenance and repair work. As a result of these measures, the load on basic main pipelines was increased by 2-5 percent.

The continuous increase of the actual weight of gas in the national balance of fuel and energy, the greater amount of natural gas used at electrical power plants and an increase in the average transport distance requires serious work to increase the reliability and stability of the nation's Single natural gas supply network, especially during winter periods. In order to perform the basic measures needed to guarantee the reliability of the existing system, the directors of associations, underground storage stations and design institutions should hasten their work on the development of standard modular underground storage stations that process the gas before it is fed into the main pipelines. They must also prepare schedules and work to prepare reservoirs to receive gas during winter periods its extraction during the winter of 1985-86. The work must be done so that not a single well does not remain unconnected to the system and so that all reservoirs are ready for gas extraction by 1 November.

The chief task of associations, plants and organizations in the realm of capital construction is scheduled submission to construction organizations of design and budget documentation, equipment and materials for bringing planned facilities into operation.

The ministry has carried out a considerable amount of work to improve the organization of capital construction projects, increase the efficiency of capital investments and to provide construction projects with material and technical resources. However, as last year's results showed us, this work still has many shortcomings. Above all, it suffers from delayed submission of design and accounting documentation which in many cases is of low quality. The All-Union Industrial Institute of Natural Gas Production has been slow in providing production sites of the Urengoy deposit and Shurtan complex with the necessary design and budget documentation. Serious errors in the were made in designing platforms for a condensate stabilization plant in the city of Surgut. The design was unfinished and lacked axonometric schemes for the assembly joints. It has been reviewed several times but the problems have still not all been resolved.

The Soyuz Natural Gas Design Bureau [Soyuzgazproekt] has been slow in its work on condensate pipeline designs. The State Institute of Pipeline Design and Specialized Construction, the Southern State Science Research Institute of Natural Gas Pipeline and Specialized Construction and other institutions

responsible for regulating experimental design work must work to considerably raise the quality of designs and estimates, strictly follow published specifications on equipment and materials and not allow any changes without the approval of the client.

The Tyumen Natural Gas Industry Association, Ukrainian Natural Gas Industry Association, Turkmen Natural Gas Industry Association, Kuybyshev Gas Transport Association, Moscow Gas Transport Association, Leningrad Gas Transport Association and Azov Gas Transport Association have not at the proper time provided contractors with itemized lists for construction projects, schedules for the assembly of equipment and materials, land diversion acts, design and budget documentations and other such documents.

The directors of associations, directorates and the client plants must improve the organization of equipment orders and its delivery to construction projects and more strictly observe design specifications. The most important aspects of their work is that they divert land on time, deliver equipment to construction sites, improve the quality of construction and reduce estimated costs.

In establishing the requirements for the design of new objects, they must not allow any figures to be added if they are not included within the design. They must strive to reduce estimated costs.

Special attention must be given to the needs of employees of the natural gas industry. In order to improve their social and living conditions, it has been planned this year to create 970,000 m² of housing space, add 330 new hospital beds and increase the capacity of medical clinics by 1500 places. Schools will be enlarged to take in an additional 3800 pupils while preschools will be able to admit another 5000 children. Secondary agricultural production will also be further developed.

The high rate of growth in the construction of public facilities and housing will be continued. Good conditions have been established for successful realization of the five-year plan's tasks in the creation of new housing, kindergartens and hospitals.

Along with this, the Saratov Gas Transport Association, Volgograd Gas Transport Association, Kuybyshev Gas Transport Association, Ural Gas Transport Association and Northern Caucasus Natural Gas Industry Association have unsatisfactorily carried out their work to improve living conditions. They have too slowly prepared design budget documentation and put together the necessary equipment and materials and they have not established any close supervision of the work of their contractors.

The Tyumen Natural Gas Industry Association has not carried out plans to open new housing in Novoye Urengoy, Pangoda or in the Finnish settlements at the compressor stations. There have frequently been cases in which public housing was opened before it had been properly finished.

Observing the increased amount of construction that associations do for themselves, the collegium pointed out serious shortcomings of this important

direction in the natural gas industry's management activity: 23 out of 41 associations did not fulfill their plans for commercial construction and 20 associations did not fulfill their task to raise the level of worker productivity.

Very soon, the workers of central apparatus of the ministry, associations and plants will have to review the management of their own construction, improve the organization of material and technical supply and raise the quality of planning in associations and trusts.

A greater level of re-equipment is a decisive factor in hastening the production of more natural gas.

In 1984, a great amount of work was done to introduce new technology and progressive technical designs. The UKPG-1AS, the first to be equipped with automated lines with an output of 10 million m³ of gas per day, which was put into operation at the Urengoy deposit made it possible to reduce construction time by 1.5-2 times.

Other work has been carried out to create a new generation of microprocessor-based automated control systems. In 1985, the Urengoy deposit should receive the first series of microprocessor automated control systems. This work is of great importance since it creates the technical base for large-scale automation of mines and conversion to advanced forms of operation.

In conjunction with the Ministry of Petroleum and Natural Gas Construction, the decision was made to build up the Yamburg deposit and place technological equipment on pontoons with lift loads of 500 tons and more. At the present time, the delivery of pontoon-supported equipment for UKPG-2 has begun. This deposit will be exploited on a completely new technical basis providing the high level of automation, a sharp drop in the number of operating personnel and an increase in worker productivity.

Along with the successes achieved in natural gas science, there are certain shortcomings that have held up the realization of our scientific potential. For example, scientific and technical centers such as the All-Union Scientific Research Institute of Natural Gas and the have still not made full use of new and advanced forms managing scientific work. Trivial digressions have not been eliminated, especially in the plans of regional institutes that often carry out unpromising work on association tasks.

The branch scientific research institutions led by the All-Union Scientific Research Institute of Natural Gas and All-Union Industrial Science Research Institute of Marine Petroleum and Natural Gas must concentrate their forces on more important directions and most of all on activating work to save fuel and energy, material and labor resources and reduce the amount of manual labor. They must complete work on the introduction of [ASU-zapchast' and ASU-komplektatsiya].

Technical administration and the industry's management must improve the efficiency of plans for new equipment and the regulation of the industry's scientific activities.

In 1984, with the help of leading scientists and specialists, a detailed program for scientific and technical progress in the natural gas industry was worked out for the coming five-year period and beyond and tasks were set for the creation of new equipment. Now the administration of the central apparatus and institutes must realize these tasks. The main task at this time is to see that the creation of new equipment needed by the industry be included in the plans of the machine-building ministries.

The natural gas industry has carried out much work to save resources. Its 1984 tasks were fulfilled in their entirety. About 6.9 million tons of standard fuel and 500 million kilowatts of electrical energy were saved along with 5 million GJ of secondary power resources.

The collectives of the Ukrainian Natural Gas Industry Association, the Leningrad Gas Transport Association and the Ural Gas Transport Association are carrying out their work using principles of good management.

However, regardless of the methods they use, some associations are allowing over-consumption of fuel, lubricants, metal and chemical reagents. In 1984, the gas transport associations allowed over-consumption of natural gas for their own needs and a technological losses of about 605 million m³ (489 million at the Central Asian Gas Transport Association and 501 million at the Asian Gas Transport Association).

Costly chemical reagents are being over-consumed in well-drilling by the Norilsk Natural Gas Industry, Kaliningrad Marine Petroleum and Natural Gas Industry and Soyuz Uzbek Natural Gas Industry associations. The Bakinsk, Votkinsk, Tashkent and Ordzhonikidze natural gas apparatus factories have not fulfilled their tasks to save rolled metal. Methanol has been over-consumed at the Sakhalin Marine Petroleum and Natural Gas Industry Association and the Main Southern Natural Gas Transport Association while the consumption of drilling pipes has been too high at the Soyuz Uzbek Natural Gas Industry and the Yakut Natural Gas Industry associations.

This examples show that not all associations and plants are still not paying enough attention to thrift and the economic use of resources. Ministerial directives to associations on differentiation and adaptation of norms on resource consumption and material conservation orders to production divisions, compressor stations, shops, crews and every workplace are still not being fulfilled by everyone. We must see that every worker has the proper instructions, specific tasks and personal accounts on economy and is actively committed to achieving the best results.

The majority of worker collectives have decided to create at their plants a fund for savings beyond the plan and to work no less than two days per year using saved materials, raw materials and fuel. We must work seriously to perform this patriotic task.

One of the basic factors in the growth of labor productivity is the distribution of collective forms of organizing worker pay. At the present

time, the ministry employees 13,500 worker brigades containing more than 55 percent of its work force. More than half of these brigades work with extra pay but the worker participation coefficient is adapted to the average wages in 36 percent of the brigades. In these brigades, work has improved, cadres have stabilized, professional skills have improved and discipline has been raised. With the wide distribution of brigade organization, the role of the foreman has become more important. However, foreman training programs are still weak, especially in the Turkmen Natural Gas Industry, Soyuz Uzbek Natural Gas Industry and the Main Central Natural Gas Transport Associations.

Not enough attention has been given in training centers to the training of worker cadres. Thus, at the Caspian Marine Petroleum and Natural Gas Industry Association, the training and course center built four years ago still lacks the necessary materials and the quality of its training programs is low. Workers are still not being trained on the Floating Drill Platform imeni 60-letiya Oktyabrya which was specially given over for use as a training center.

The main school for the natural gas industry, the Omsk professional training school where welders and machine operators are trained, has not received necessary quantities of training equipment for road building. The training of workers for the Mubarek gas-processing plant has been unsatisfactory. At this plant's training center, teacher training is low, the stock of textbooks and learning materials is poor and the center itself is located in uncomfortable quarters. The Soyuzgazavtomatika All-Union Science and Production Association has still not taken up the training of compressor operators and shift engineers on an experimental trainer that simulates the work of a GTK-10-4 compressor.

12261
CSO: 1822/316

OIL AND GAS

OIL IN OCEANS: POLLUTION OR NATURAL INGRESS?

Moscow PRIRODA in Russian No 7, Jul 85 pp 28-35

TROTSYUK, V.Ya. and NEMIROVSKAYA, I.A., Institute of Oceanology
imeni P.P. Shirshov, USSR Academy of Sciences

[Abstract] A mini review is presented of the problem of petroleum hydrocarbons in the marine environment, which represents not only an oil pollution problem, but also reflects natural seepage of oil from the benthic surface. Once commingling occurs, the hydrocarbons from both sources are subject to the same types of transformations via the biogeochemical cycles, and render it difficult, if not impossible, to distinguish pollution from natural seepage in many cases. Such factors also complicate search for marine deposits of oil and gases, and require careful monitoring of background levels to ascertain possible areas for exploration. Current estimates are that approximately 30 percent of oil in the marine environment comes from domestic and industrial waste waters, 27 percent from ships, 7 percent from the atmosphere, 12 percent from various accidental spills, and 24 percent from natural seepage from the bottom surfaces of oceans. Figures 5; references 6: 4 Russian, 2 Western.
[321-12172]

CSO: 1822/321

OIL AND GAS

SYNOPSIS OF ARTICLES IN NEFTYANAYA I GAZOVAYA PROMYSHLENNOST, JULY-SEPTEMBER 85

Kiev, NEFTYANAYA I GAZOVAYA PROMYSHLENNOST in Russian No 3, Jul-Sep 85 (signed to press 2 Aug 1985) pp 55-56

UDC 550.834

SEISMIC PROSPECTING FOR NON-ANTICLINE HYDROCARBON TRAPS

[Synopsis of article by Ye.P. Puzdrovskiy, pp 8-10]

[Text] This article discusses the need to restructure 3D seismic exploration in the light of a new task: prospecting for non-anticline oil and gas traps. Recommendations on improving field methodology and the use of new computer programs to process seismic data are given. The need to train geophysicists to interpret data using seismostratigraphic and facies analysis methods is stressed. 5 references.

UDC 553.98.041.551

PROSPECTS FOR OIL AND GAS IN THE SKIBOV AREA IN THE CARPATHIANS

[Synopsis of article by M.I. Shevchuk and M.Yu. Stotskaya, pp 11-13]

[Text] Studies based on the geological structure and known oil and gas potential of shallow Cretaceous-Paleogenic sediments in the southwestern part of the Skibov area in the Carpathians have established the likelihood of hydrocarbon accumulations. Recommendations on oil and gas exploration are given. 1 figure.

UDC 550.832

DETERMINING GAS/OIL CONTACT DEPTH WITH NEUTRON-GAMMA LOGGING DATA

[Synopsis of article by A.N. Maksimenko, G.L. Trofimenko and V.P. Shishkina, pp 14-16]

[Text] Geological and geophysical factors are analyzed which determine the distinctive composition of residual water of traps in oil- and gas-bearing zones of formations. Under favorable conditions, these factors may provide a sufficient difference in electrical resistance in certain formations saturated with hydrocarbons in various phases to locate their depth reliably in the gas/oil contact profile, using electric logging data. Experience at the Timofeyevskiy Field indicates that the efficient utilization of electric logging to determine gas/oil contact depth is feasible. 1 table, 5 references.

ESTIMATING OIL RESERVES IN EOCENE SEDIMENTS IN THE DOLINSKIY FIELD

[Synopsis of article by N.F. Koziy, I.T. Mikitko and P.N. Zasadnyy, pp 16-18]

[Text] Development drilling and production of Eocene producing formations have yielded new data that have made it possible to make a definitive evaluation of the Yamnenskiy formation and more accurately describe the tectonic structure of the Dolinskiy fold, the oil-bearing province, the actual oil-saturated zones and the production potential of individual formations. These data, together with all available geological field data, were used to arrive at more accurate calculated parameters and more reliable estimates of oil and associated gas reserves in the Eocene reservoirs. 1 table.

UDC 550.89.512.93

A LITHO-PHYSICAL MODEL OF PROSPECTS OF THE NORTHWESTERN PROFILE OF THE DDV
[not further identified]

[Synopsis of article by V.M. Lakhnyuk, G.I. Ovseyenko and V.F. Indutnyy, pp 18-21]

[Text] This is a first attempt to develop standard litho-physical models of profiles to study the potential of hydrocarbon reservoirs by geophysical methods. Statistical generalization and the analysis of data on geolitho-acoustic properties of rock are stressed: these properties are related to the geophysical prerequisites for direct exploration. Analysis of the geological profile is petrophysically based on the main-components method. 3 tables, 3 references.

UDC 550.834.04

ORTHOGONAL LOGGING SYSTEMS OMITTING SOME INTERVALS

[Synopsis of article by D.N. Lyashchuk, Ye.I. Sagalova and I.V. Guk, pp 22-21]

[Text] It has been shown that in orthogonal logging systems omitting some intervals, for general downhole points with different abscissas, adding is done in various areas of the OGT [not further identified] hodograph, which differ considerably from each other. It is thus practically impossible to determine system parameters to attain the same degree of attenuation of regular high-velocity interference waves, so these systems are recommended to identify and classify lateral waves. Formulae are given for calculating system parameters used to solve this task. 4 references.

HYDRAULIC ASPECTS OF TUBING STICKING PROBLEMS CAUSED BY DIFFERENTIAL PRESSURE

[Synopsis of article by V.G. Yasov, M.A. Myslyuk and A.V. Anis'kovtsev, pp 24-26]

[Text] Results are given of theoretical research on the range of formation pressures in the immediate vicinity of the wellbore and the formation of a shielded area around a stuck tubing string as liquid seeps out of the well into the formation. Their considerable effect on the force tending to press the tubing against the wellbore and the consequences of the use of liquid treatments to unstuck tubing strings are discussed. 4 references.

UDC 541.18

THE EFFECT OF POLYELECTROLYTES AND BIOPOLYMERS ON DRILLING MUD PROPERTIES

[Synopsis of article by L.N. Loktionova, Ye.N. Ignatenko and B.D. Yemchuk, pp 27-29]

[Text] The results are given of research on the effect of polyelectrolytes and biopolymers on water dispersions of polygorskit with low solid content. Using the data obtained, it was shown that polyelectrolytes in suspensions of polygorskit in water intensify aggregation. Mixtures of biopolymers and hydrolyzed polyacrylonitrile are promising in the production of highly stable circulation fluids. 2 tables.

UDC 622.244.45

MULTIPURPOSE BP-100-BASE DISPLACEMENT FLUIDS

[Synopsis of article by A.K. Kuksov and R.F. Ukhanov, pp 29-31]

[Text] Results of laboratory and field research on mass-produced BP-100 displacement powder are given. It is noted that BP-100-base displacement fluids are effective in displacing not only weighted drilling fluids, but also conventional mud where the use of water as a displacement fluid might dissolve kill fluids as it washes filter cake from the wellbore. 1 illustration, 1 table.

UDC 622.279.42

INCREASING CONDENSATE PRODUCTION IN RESERVOIRS PRODUCED BY CYCLING

[Synopsis of article by V.S. Grigor'yev, pp 32-36]

[Text] A method is described for determining ultimate condensate recovery which takes into account specific gas condensate properties of the reservoir, different production behavior of reservoirs and gas produced prior to the beginning of the cycling process. On the basis of Zone T-1 of the gas condensate reservoir at Timofeyevskiy Field, it was shown that production of gas prior to the beginning of the cycling process considerably reduced ultimate condensate production and adversely affected the pressure maintenance program. 3 figures, 3 references.

EVALUATING THE PERFORMANCE OF NATURAL GAS TREATMENT FACILITIES

[Synopsis of article by M.K. Davidyuk, M.F. Khut'ko and G.T. Shagalova, pp 36-37]

[Text] The methodology is described and results of field and laboratory research are given on the performance of natural gas treatment facilities at fields produced by Ukrneft Production Association. Practical recommendations are made for increasing production of hydrocarbon liquids and improving calculations in cooperation with non-field gas consumers. 1 figure.

UDC 621.438(088.8)

SYSTEM FOR CLEANING MAIN FLOWPATH OF AXIAL GAS-TURBINE COMPRESSORS

[Synopsis of article by N.N. Alekseyenko, A.I. Yeshchenko and G.N. Prokof'yeva, pp 41-43]

[Text] A liquid cleaning system is described for cleaning axial compressors at gas booster stations driven by gas turbines. Cleaning solutions are recommended. 2 figures, 3 references.

UDC 622.69

DIALOG SYSTEM FOR DESIGNING A GAS DISTRIBUTION SCHEDULE BASED ON A NON-STATIONARY MODEL

[Synopsis of article by V.Z. Amkhinich and M.M. Margulis, pp 43-44]

[Text] A current task is examined which has arisen in operating a trunk gas pipeline subject to distribution parameters: the selection of a transitional (non-stationary) gas distribution schedule. 2 references.

UDC 621.643.001.4

SHUTTING DOWN A PIPELINE BY FREEZING ITS LIQUID MEDIUM

[Synopsis of article by V.I. Kozitskiy and V.I. Mogil'nyy, p 47]

[Text] The results of experimental research are given on shutting down a 219-mm pipeline containing water by freezing ice plugs in the line. Applications are given for the use of a device which shuts down pipelines by freezing the liquid medium being transported.

UDC 622.691.24:552.578.1.061.7(477.8)

EVALUATING THE RELIABILITY OF ROCK OVERLYING UNDERGROUND GAS STORAGE FORMATIONS

[Synopsis of article by V.A. Danilenko, V.V. Ivanov and M.S. Pokryshko, p 45]

[Text] A conclusion on increasing gas injection pressure in underground storage formations is reached on the basis of experimental research and studies on

the barrier properties of rock overlying underground gas storage formations at temperatures and pressures similar to formation conditions. 1 table, 2 references.

UDC 665.662.36

EXTRACTION OF PLATFORMING GASOLINE AND OIL DISTILLATE

[Synopsis of article by M.M. Babyak, P.I. Topil'nitskiy and V.T. Grushchak, pp 50-52]

[Text] A combination process of extracting platforming gasoline and medium-weight oil distillate is studied, using statistical planning. The production of extracts containing 97 percent aromatics is shown, with high simultaneous production of refined oil meeting requirements of the State specification for I-20A grade oil. 2 tables, 2 references.

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COAL

STANDARD CRITERIA FOR FUEL COAL REQUIRED FOR POWER STATIONS

Moscow KHOZYAYSTVO I PRAVO in Russian No 11, Nov 84 pp 65-66

[Article by V. Durnev, director of the technical division of the Urals Center for Standardization and Metrology: "Necessary Single Criteria"]

[Text] Many Soviet power plants work on fuel imported from other areas. Two conditions must be fulfilled for these plants to provide uninterrupted electrical energy. The first is that fuel deliveries follow strict schedules and the second is that the supplied fuel satisfy the quality requirements stipulated by contract or the GOST standard relevant to that particular grade. In other words, the supplier must be very dependable and put state interests ahead of his own. He must also strictly observe the principles of equal rights between parties to a contract.

Unfortunately, this principle is not always followed and that is most often the fault of the supplier who dictates his will upon his contract partner.

In the Sverdlovsk province, several power plants are fired with delivered fuel that is supplied to them by the Ekibastuzugol Production Association. One of the largest purchasers of Ekibastuz coal is the Reftinovo State Regional Power Plant which is part of the Sverdlovskenergo power system and provides the Ural industrial region with electrical power. The quality of the coal it uses is of great importance to this plant and the supplier does not always take this into consideration. Coal quality is not only stipulated by the supply contract but is also regulated in GOST 8779-79, "Ekibastuz Basin Coal for Pulverized Combustion". This standard specifies the required quality of Ekibastuz coal and sets regulations on the consignment of this fuel as well as the methods used to test seam samples in the supplier's laboratory to check the qualitative indicators. This standard protects the interests of only one side in a supply contract which is, in the given case, the Ekibastuzugol Production Association. Why is this? This is above all because the seam sample method cannot provide any reliable indicators of coal quality. This method and the relevant GOST standard, "Methods of selecting seam samples", is useful only for preliminary determination of coal quality in mines and open pits and for calculating coal resources. The great difference in the conditions under which seam samples are selected and powerful rotary excavators mine the coal lead to discrepancies between the results of seam sample analysis and the actual quality of the Ekibastuz coal supplied to consumers. In using GOST 8779-79 which gives it the right as a supplier to

set coal quality, the Ekibastuzugol Production Association uses its own data for its calculations on coal quality. At the same time, however, the Reftinovo Power Plant conducts its own laboratory analysis of the coal it receives before it is fired. The results that the plant obtains from its own analysis sharply differ from those of the supplier.

Thus, in accordance with the instructions the supplier uses to determine the fuel quality, the heat of combustion can be no lower than 3850 kcal/kg and the maximum ash content is 43 percent. According to the Ekibastuzugol Association's figures, the quality of its coal meets these requirements. According to the Reftinovo State Regional Power Plant, however, the ash content of this coal exceeds its maximum over days and lots and is increasing from year to year.

It is now felt that it would be better to determine the coal quality immediately before firing rather than when it is mined. Unfortunately, existing standards and technical documents do not give a clear answer to this. Therefore, the supplier uses GOST 8779-79, methods that protect his own interests and his own figures to calculate his coal output. At the power plants that are supplied with this fuel, an automatic sampler is used to determine the coal quality immediately before firing and according to GOST 10742-71, this is most often the best and most objective method for laboratory testing of coal samples. Naturally, the Reftinovo Plants' figures on the coal it fires turn out to be much worse than those given by the supplier. The consumer has therefore overpaid the supplier by two-three million rubles every year since 1979. The cause for such overpayment is low coal quality and this is in part due to the imperfection of the existing GOST standard. Even if the supplier had not exaggerated the fuel quality, it would still provide only the same amount of calories that it actually contains and that is no more than the amount figured before it is fired. The number of calories on paper (according to the seam sample method) are simply not what you get.

We must add that the GOST standard does not require the supplier to weigh the coal that it supplies. The Ekibastuzugol Production Association reckons its coal visually and then corrects its figures using the buyer's data. This also fails to provide accurate data on how much fuel is actually obtained.

The frequent appeals made by buyers to various institutions to change the GOST standard have still not found much support and the squandering of state resources continues.

Obviously, the USSR Ministry of Coal and the Ministry of Power and Electrification must re-examine the instructions for determining commercial Ekibastuz coal quality by means of seam samples and the rules used by power plants to evaluate fuel. It is also necessary to improve GOST 8779-79 and especially the rules of consignment and selection of fuel samples tested by the supplier. It would probably be feasible to supplement the standard with requirements aimed at improving the methods used by the supplier and the buyer to determine coal quality reject any single approach to the quality of coal used in power plants so that the calculations of both the supplier and the buyer would give an accurate picture of what is mined and what is actually

used. This would satisfy the provisions of the Central Committee's 30 June 1981 Decree No. 612 "On intensifying work to economize and make rational use of raw materials, fuels and other resources".

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NUCLEAR POWER

BILIBINSKAYA AES TO BE MODERNIZED

PM100817 Moscow IZVESTIYA in Russian 2 Sep 85 Morning Edition p 3

[Own correspondent R. Bismukhametov dispatch: "The Arctic's Useful Atom"]

[Text] Today "reconstruction" is the most popular word at Chukotka's Bilibino AES. The capacity of reactor installations at the first AES in the country's Northeast has increased considerably thanks to technological modernization.

For 10 years now this power station has been supplying electricity to the mining enterprises and settlements scattered over the vast area of Bilibinskiy Rayon's 175,000 square km of territory. S. Borzov, chief of the production-technical section, shows with obvious pleasure the spacious halls of the power station and the computer center.

The work done for 10 years by the Bilibino AES under the conditions of the Far North can boldly be described as an industrial experiment which has been completely vindicated. Technical problems have occurred during the utilization of equipment. The reconstruction plans envisage their solution.

The economic effect from various new developments has already reached R3 million. Changes in the AES's technological configuration have made it possible to supply the entire settlement not only with light but also with heat. The station has also started to "heat up" a major hothouse complex whose first stage will start delivering vegetables to the kindergarten and preventive medicine sanatorium next spring.

The reconstruction is also having a favorable effect on the appearance of the settlement of Bilibino. Here, in the forest-tundra, it has been decided to extend the trolleybus line and link Keperveyem airport with the Bilibino settlement. In this case it will not only provide comfortable and trouble-free transportation for passengers and freight, but will also result in great savings of petroleum products, which have to be delivered here over many thousands of kilometers along the Northern Sea Route.

CSO: 1822/27

8 November 1985

NUCLEAR POWER

CRITICISM OF CHEKHOV POWER MACHINEBUILDING PLANT

LD012112 [Editorial Report] Moscow Television service in Russian at 1530 GMT on 1 October in the "Vremya" newscast carries a 3 and 1/2 minute video report by A. Krutov on a raid by peoples controllers on the power machine-building works at Chekhov in Moscow Oblast, the leading factory producing high-pressure fittings for atomic and thermal power stations.

The report opens with shots of the factory. Against a background of rusting pipes and other equipment, G.S. Korenev, an inspector of the Moscow Oblast People's Control Committee, is seen rebuking G. A. Chistyakov, the factory director, for mismanagement and inefficiency. Chistyakov admits that he is also worried by "above average waste" but that the factory is experiencing "very great difficulties." O. R. Mozharov, the factory's deputy director, explains that supplies are often incomplete. Korenev replies that according to the law they ought to return the incomplete supplies, refuse to pay for them, and demand new ones. He asks where the factory gets the money from to pay for above average supplies. Chistyakov answers that they have received R2.5 million worth of credit on which they had to pay R48,000 interest from the factory funds, which could otherwise have been spent on re-equipping the works and on social development. Chistyakov admits with a laugh: "The working class cannot say anything good about us."

Korenev sums up by saying that the raid has revealed that so far the factory's management and specialists are not adapting well to the demands of a factory working under the conditions of the economic experiments and that all this affects the efficiency of the enterprise. Chistyakov says: "I agree." He promises that by the end of 1986 things will be put in order. But Korenev says he disagrees because things look like they are continuing as before.

The camera then shows the reflection of the factory building in an enormous muddy puddle covering the road leading to the building. Krutov adds in conclusion: "The help of the Ministry of Power Machine Building is evidently also needed to put things in order."

CSO: 1822/39

NUCLEAR POWER

BLAME ASSIGNED FOR DELAYS AT 'MODEL' BALAKOVSKAYA AES

[Editorial Report] Although most of the organizations involved in the construction of the Balakovskaya AES have overfulfilled their plans in financial terms, the schedule for start-up of this "model" site is being increasingly delayed, according to an article by correspondent Ivan Podsvirov on page 2 of the 15 September 1985 edition of SOVETSKAYA ROSSIYA. High-quality designs were not forthcoming in a timely fashion from the Urals Division of the Atomic Thermal Power System Design Institute, as well as from other establishments in Gorky, Moscow and Kharkov. Tardy supply of equipment and, especially, poor coordination between the general- and the sub-contractors are also blamed. The author of the article criticizes in particular the "mistakes" of the director of the Saratov GES Construction Administration, Aleksandr Ivanovich Maksakov, who, he states, reproached the assembly administrations for holding up work on the first power-unit, when the guilty parties were actually subdivisions of his own organization. A general contractor, according to the author, will sometimes take credit for the success of the assembly organizations in making up for his own untimeliness, and will blame the subcontractor for his own delays. Details on the length of the delay or the proposed start-up date of the station were not given in the article.

The author notes that the authorities at the Ministry of Power and Electrification believe that the speed of construction nationwide of atomic power stations must be doubled, at a minimum. This can be achieved by creating a standardized design and the introduction of line production. The Balakovskaya AES is one of the first stations to incorporate this method of construction, states the author.

CSO: 1822/2

NON-NUCLEAR POWER

NEW SHALE OIL TECHNOLOGY MAY APPLY TO BURNING LOW QUALITY COAL

Tallin SOVETSKAYA ESTONIYA in Russian 14 Aug 85 p 2

[Article by ETA [Estonian News Agency]: "Life Poses Tasks"]

[Excerpts] A new technology for burning shale has been used at the Pribaltiyskaya GRES imeni Leninskiy Komsomol at the suggestion of five young researchers.

The currently accepted technology is still far from having been perfected. Because of the high mineral-substance content, only a fourth of the fuel rock loaded into the firebox burns, the rest settling in a pumicelike cake on boiler walls and going off into the atmosphere.

The young scientists Igor Shchuchkin, Aleksandr Solovey and Vitaliy Zakharov, graduate students of Leningrad Polytechnical Institute, to which Rayvo Touart from the Tallin Polytechnical Institute has been attached, have proposed to change basically the method of burning the fuel. Shale at present is not ground to a dustlike state, but is injected coarsely crushed into the boiler's chamber. This permits the counterairflow to return it to the firebox until the organic part burns up completely. Since the combustion temperature in this case is reduced by about 500 degrees, the mineral portion does not cling to the walls, but falls into the ash trap, the design of which also was developed by the young researchers.

When the Pribaltiyskaya GRES was rebuilt, 13 boilers were given to the group of scientists for experiments. The "unlucky" number proved to be lucky. The mathematical computations were confirmed in practice.

The new technology has passed the test of time. The 13 boilers are giving continuously 1.5-fold more heat and electricity than prior to the rebuilding and, in so doing, they require much less raw material. The discharge of waste into the atmosphere has been reduced. The four young scientists have defended their candidate dissertation.

The work performed is of great national economic importance. The USSR Energy Program calls for the wide use of low-grade, inexpensive types of solid fuel. The effective technology developed enables it to be used also for the low-grade coals of the Kansk-Achinsk, Ekibastuz, Berezovo, Yuzhnyy Yakutsk and a number of other fields in the country.

The young power engineers have new goals ahead of them. Mastery of the method they developed has started at larger boiler units, as has study of the possibilities of the industrial use of shale oil. And perhaps they will succeed in creating completely wastefree shale production. Life itself poses this task to the scientists.

11409

CSO: 1822/336

NON-NUCLEAR POWER

CRITERIA FOR LOCATING GAES, USE OF QUARRIES DISCUSSED

Moscow EKONOMICHESKAYA GAZETA in Russian No 32, Aug 85 p 6

[Article by V. Markov, senior scientific staff worker of the Commission on Study of the Productive Forces and Natural Resources (KEPS) under the AN SSSR [USSR Academy of Sciences] and candidate of Geologico-Mineralogical Sciences: "An Electric-Power Station in a Quarry"]

[Extract] In our country the GAES based on the Kievskaya GES has been operating for several years. Construction of the Zagorskaya and the Kayshlyadorskaya GAES's is being completed. This clearly is not enough, especially for regions where the share of hydraulic electric-power stations in the power-supply system is not large. For example, in the Urals region the share of GES's in total generation of electricity is 6.9 percent, in the Ukraine it is 9 percent. The creation of flexible power capacity for such regions is becoming a sharp necessity.

However, the construction of GAES's requires extremely long time periods because of the necessity for performing large amounts of earthmoving work and because of the great capital investment (the budget-estimated cost of the Kayshlyadorskaya GAES is 270 million rubles). Moreover, there is a relatively limited number of sites where the natural conditions are suitable for GAES construction. Usually such areas are found in regions with broken-up relief (mountains and foothills), while the main consumers for electricity are concentrated in lowland regions.

It is clear that all this will in no way help to increase flexible capacity. Is it possible to reduce the costs of building them?

A Glance at Worked-Over Terrain

It is said that the Korkinskiy Strip Mine can easily be seen from near-earth orbit. And this is not surprising: for the mine is 420 meters deep, and the volume of the man-made lowland exceeds a billion cubic meters. This is the largest excavation on the Eurasian continent.

Beside the Korkinskiy Strip Mine, in Chelyabinsk Oblast alone 120 open pits for mining useful minerals are in operation, 20 of them more than 100 meters deep. In the whole country there are about 60 completely worked-out deep quarries whose bottoms are below the 100-meter level.

Such man-produced low spots are growing in number because of expansion of the mining of minerals by the open-pit method. Thus, it is planned to mine up to 80 percent of all ore in open-pit mines. It is proposed that by the year 2000 more than 100 deep quarries, which will take up no small area, will be depleted.

Recultivating these lands is a complicated problems. Solution of it has not always been possible. But it must be solved, considering the scale and the prospects for developing open-pit mining.

At a seminar that was held in June this year at the Chelyabinsk All-Union Seminar on the Economic Use of Deep Quarries, it was proposed that these artificial depressions be used for building GAES's. What arguments speak in favor of such a proposal?

Let us begin with the fact that in a deep quarry the necessary drop in height already exists. Creation of such a drop under other circumstances would involve great expense. Expenditures are especially great for building GAES's in flatland regions, precisely where the power capacity is needed. During quarry operation, not only are useful minerals mined, but a low basin is created for a future GAES without one additional ruble of investment.

And how is an upper storage basin built? If the station is being built in an already-depleted quarry, the upper basin can be built with the tailings and stripped rock that have accumulated within the mining concession. Incidentally, this will enable the height of the drop to be increased, for the dump ordinarily has a leveled height of 50-120 meters.

However, it is not mandatory, when building an upper storage basin, to wait for full depletion of the quarry. On the contrary, it is economically more desirable to start this ahead of time, when the deposit is being excavated, placing the discharged tailings and stripped rock at the side of the future water reservoir, instead of simply storing them. The additional expense would not be great, and then time and funds would be saved that would otherwise have been spent on building the basin after the forming of the usual tailings dump.

As is known, old quarries get completely filled with water after a certain time. In a deep quarry, stratal water, soil water and atmospheric precipitation accumulate in the amount of up to 0.3 km^3 . This is completely enough for operation of a GAES of any capacity.

It is more rational to do not only the construction but also the filling up of the upper storage basin ahead of time, while the quarry is still in operation. Water can be obtained here for this purpose without spending any special funds for pumping it.

The fact is that each quarry has a drying activity. The stratal water is pumped out by special pumps and, moreover, a network of water-lowering (drainage) hole is created. According to the reporting data of branch ministries, for each ton of material mined from a deep quarry, 3.5-4 cubic meters of stratal water must be pumped out. So the pumping of stratal water comes to much more than the 30 million m^3 needed for filling the upper pumped-storage basin, this being accomplished in an extremely short time.

Thus, the water which right now is just pumped from the quarries will be accumulated for future use, employing the very same equipment. And not just for the future. The surplus of water can be sent off for irrigation. This is all the more important because a so-called cone of depression is formed in the area of a deep quarry, and the soil dries up within a radius of several tens of kilometers.

And still another consideration. A GAES in a quarry is distinguished by a characteristic unique for any electric-power station: its potential capacity will be raised intrinsically with increase in the influx of stratal water into the excavated space. A natural water reservoir does not possess this property. This means that in time the rated capacity of the GAES units can be increased.

From the Economics Point of View

Comparative calculations tell about the high economic effectiveness of using worked-out quarries for GAES construction. Reduction in the amounts of the more intensive earthmoving operations (and under ordinary conditions they require up to 60 percent of the capital investment for GAES construction) will enable the time taken to introduce pumped-storage stations into operation to be sharply reduced and the cost of generating electricity to be cut in half.

However, evaluation of the economic feasibility of using quarries for building GAES's cannot be limited just to considerations, so to speak, of a constructional nature. The siting of prospective deep quarries relative to the base power systems is of great importance. If the quarry is too far away, then the expenditures for stringing LEP's [power lines] and the transmission losses of the power substantially reduce overall effectiveness. What is the geography of the artificial earthen lowlands?

Appropriate production facilities and whole industrial regions and clusters rise up, as a rule, close to large fields of useful minerals that are worked by the open-pit method. In order to provide them with electricity, the base power systems, which are founded on thermal and nuclear power stations and which need flexible and reserve capacity, are created to supply them with electricity. An obvious example in this regard is the Ural Economic Region, where responsive regulation of daily, weekly and seasonal electric-power consumption is strictly required. And it is here that there is a large number of deep quarries suitable for GAES construction.

The picture is the same in the southern and central zones of the European part of the country and in a number of other places.

It stands to reason that all these proposals need special scientific and technical study and accurate calculations. Obviously, it would be desirable to create for these purposes a working group made up of specialists from the USSR Academy of Sciences, Gidroyekt [All-Union Surveying, Design and Scientific-Research Institute imeni S. Ya. Zhuk], Tsentrproshakht [All-Union Central State Institute for Design and Feasibility Studies of Coal-Industry Development], NII OGR [Scientific-Research Institute for Open-Pit Mining] and USSR Minvudkhov [Ministry of Land Reclamation and Water Resources] design organizations. The integrated nature of the group conforms to the interagency and integrated nature of the problem itself, the solution of which should be considered to be in the interest of the national economy as a whole.

NON-NUCLEAR POWER

TRUD HITS DELAYS IN CONSTRUCTING POWER LINES

PM251551 Moscow TRUD in Russian 19 Sep 85 p 2

[Correspondent G. Gromyko report under the rubric "TRUD at the Smolensk AES": "Kilowatts in an Impasse. The New 'Million-Watt' Nuclear Power Unit is Working at Half Strength"; last 10 grafs are editorial comment]

[Excerpts] Smolensk -- Only someone who was at the Smolensk AES in the precommissioning period can picture the tremendous effort that went into commissioning the second "million-watt" power unit.

The joy of a labor victory -- what could be finer! But, to our profound regret, the joy was short-lived. It has turned out that all this effort, all this pace and enthusiasm have been canceled out by mistakes, blunders, indifference, and incompetence on the part of a number of ministry and department workers. For, having constructed the power station's first stage, they did not bother to construct one more power transmission line along which the current could reach cities and settlements, plants and factories. Doesn't it make you bitter: People saved minutes and hours, and now one of the "million-watt" units will be working at half-strength for long months! This not only leads to great economic losses but also does tremendous moral and ethical harm.

But how could it happen that they constructed the station but not the power transmission line? The construction of a high-voltage line (LEP-750) in the direction of Kaluga, Tula, and Vladimir began several years ago. The most complex project in the power transmission system has been the construction of a powerful transformer substation near the city of Maloyaroslavets. Construction has been going on for almost 5 years but has still not been completed. In 1983 the general contractor -- the "Elektrostroy podstantsii" Trust -- carried out work at a cost of R1 million, which is approximately one-fourth of the total volume of construction and installation. If that pace had been maintained, success would have seemed assured. But last year there was another slump -- only R380,000 was assimilated. Thus, construction laggardness was predetermined because of the irresponsibility and inefficiency of workers responsible for making decisions.

Naturally, the blame for the situation which has arisen must be borne not only by the general contractor but also by the client -- the "Dalniye peredachi" Production Association. For who, if not the association's leaders, should have ensured the transmission artery's readiness precisely on schedule? V.F. Kutuzov, chief of the association's capital construction department, explains:

"We insisted that this project be included in the list of those due for completion first in the year before last and then last year. In vain. The Power and Electrification Ministry Planning and Economic Administration did not accommodate us. The commissioning was postponed until the second half of this year."

So they were not very good at insisting. But now the chief question: What was the planning and economic administration thinking about? And where were the ministry collegium and the deputy ministers? Finally, what kind of management style is it when the various ministry subdivisions cannot reach agreement among themselves and commit the grossest mistakes and blunders?

Responsibility for the situation that has come about must also be shared by a number of plant leaders. Leningrad's "Elektroapparat" Plant, for example, supplies the substation that is under construction with air-break switches. Some of the equipment has already been received but cannot be installed because there is no technical documentation. Representatives of the client and the installation trust call the plant and send telegrams -- to no avail. The Leningrad suppliers just will not understand that what is expected of them is not a favor but merely the conscientious fulfillment of their obligations: Technical documentation must arrive together with the equipment.

The power workers also have complaints against Sverdlovsk's "Uralelektroapparat" Plant. It supplied the construction project with a 750-kilovolt switch. But 2 months ago, for some reason, it sent all the mounting hardware for it to a project in .. the Donbass. Installation of the switch is being held up. The construction site leaders appeal to the supplier -- send us the mounting hardware, quick! But he refers them to the Donbass: Investigate the matter there; we dispatched the mounting hardware...

Today it is necessary to remind the leaders of the "Dalniye peredachi" Association and of other USSR Power and Electrification Ministry subdepartments that construction of the Smolensk AFS is continuing. And it is planned to commission the third unit, also a "million-watt" unit, in 1987. So as not to repeat the mistakes of the past, it is necessary right now to think very seriously about new power transmission lines and substations.
[Gromyko report ends]

From the editors. Unfortunately, this by no means the only instance where some USSR Ministry of Power and Electrification subdepartments commission new capacities and report labor victories, while others at once "lock" them up (this term is used at the Ministry because the power transmission lines are not ready).

For this reason, for example, the Zeyskaya GES is putting considerably less energy into the network than it could. Some 100,000 kilowatts are an enforced reserve at the Maryyskaya GRES, and so forth. Of course, the Ministry of Power and Electrification does not propagandize such deplorable facts but, even according to the most modest estimates, capacities for 1.5 million kilowatts are "locked up" in the ministry's stations.

That is a lot. This is the capacity, for example, of the recently commissioned giant power unit at the Ignalinskaya AES, which is the largest in the world. We could also recall that during the Great Patriotic War years the whole of the industrial Urals, working for the needs of the front, possessed an electric capacity of approximately 1 million kilowatts.

The construction of power transmission lines is lagging chronically behind. The network construction main administrations of the USSR Ministry of Power and Electrification have not fulfilled the plan once in this 5-year plan. The arrears now total more than 10,000 km of lines of various voltages.

What is the trouble? There are no special difficulties associated with the construction of lines and transformer substations. Today, at a time of cadre shortages, the organizations of all three network construction main administrations cannot even complain of a lack of workers. There are enough people on these construction projects almost everywhere. However, the main administration workers find other reasons -- shortcomings in material and technical supplies, for example. Now, they believe, there is a shortfall of 40,000 metric tons of cable and 120,000 metric tons of rolled metal for the program's fulfillment. They have postponed the commissioning of the Mary-Karakul line, on which the full loading of the Mary GRES depends, from this year until next precisely because of a shortage of supplies, particularly cable. The second power transmission line from the Sayano-Shushenskaya GES to the Urals is being constructed only slowly.

But no one but the power workers themselves is to blame for the fact that the requirement for resources for network construction is determined on the basis of obsolete norms for expenditure of the same rolled metal and cable. The "Energosetproyekt" Institute is still only drawing up new norms. Some day they will be agreed and approved and will become a reliable basis for planning!

No, there must be no references to circumstances. The USSR Ministry of Power and Electrification is responsible for these disproportions. No one else can be blamed. Beneath this Ministry's roof there are clients, contractors, and planners of both power stations and transmission lines. Here it is impossible to refer even to departmental barriers.

What measures are being taken to rectify the situation? Sometimes very strange ones. For example, they have taken the "locked-up" capacities

of the Kalininskaya AES and switched them into the Leningrad-Moscow LEP-750 power transmission line. What has come of this? The Kalinin station has started working at full capacity, while on the other hand 400,000 kilowatts have been "closed down" at stations in the northwest of our country, including the Leningradskaya and Ignalinskaya AES's, which used to transfer energy to the Central Region. No, not now but at least 2 years ago the construction of the line from the Kalininskaya AES toward Vladimir should have been started.

The Ministry of Power and Electrification mostly reports back on the commissioning of power unit capacities. But power transmission lines and substations are less "report-intensive" projects, and so they are evidently constructed at a snail's pace.

The fifth power unit at the Azerbaidzhan GRES, with a capacity of 300,000 kilowatts, is being prepared for commissioning. However, the 244km LEP-500 line to Apsheron is very far from completion. So the number of "locked-up" capacities is not diminishing. In this way some ceremonious reports of commissionings lose their value. You wonder why we should expend resources accelerating the construction of particular stations, if it is known in advance that they are doomed to stand idle? It is high time to plan and construct power stations, power transmission lines, and transformer substations as a single complex.

CSO: 1822/26

NON-NUCLEAR POWER

NOVOSIBIRSK TETS FAULTED FOR POOR WINTER PERFORMANCE

[Editorial Report] Moscow IZVESTIYA in Russian on 16 July carries on page 2 a 1,500-word article by correspondent A. Illarionov which criticizes the performance during last winter's severe weather of the Novosibirsk TETs-4. The director of the TETs, Yu.V. Ivanov, is quoted as stating that the TETs underperformed by 15 percent, when measured against pipeline capacity. The burden on the "peak-load" boilers, which were not designed for uninterrupted loads lasting many months, led to accidents and caused "17 emergency halts for repairs." Several reasons are offered in the article for this situation. Construction progress under the Siberian Energy Construction Institute (Sibenergostroy) in general has been slow, and especially construction of the Novosibirsk TETs-5. The TETs-4 began the winter with repairs not completed on three boilers. The author faults a new method of boiler assembly where the upper half of the unit is installed from the outside, exposed to the winds and frosts of the Siberian winter. The author also faults the aging network of pipes which carries steam to Novosibirsk residences. He cites instances of pipeline breakage and geysers appearing in the streets, and states that "the loss of deficit heat through the inter-residential pipeline network has become more a rule than an exception."

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CSO: 1822/15

NON-NUCLEAR POWER

TUYAMUYUN GES PROGRESS REPORT

[Editorial Report] Tashkent SOVET OZBEKISTONI in Uzbek on 4 June 1985 carries on page 3 a 1,400-word article by Iskandar Yusupov, chief of the Tuyamuyungidrostroy Construction Administration, entitled "Tuyamuyun in the Service of the Five-Year Plan" in which he discusses the work of the labor collectives building the Tuyamuyun GES. The complex has already begun to serve the 11th Five-Year Plan. Over 5 billion cubic meters of water are held in four reservoirs. This water will make it possible to expand irrigated lands by 245,000 hectares in Khorezm Oblast and to ensure the supply of water to 500,000 hectares of land in Karakalpakistan and the Tashavuz Oblast of the Turkmen SSR. All of the six power aggregates of the GES have been commissioned and have begun to supply electric energy. Thus far, the complex has produced a total of 700 million kilowatt hours of electric energy and diverted 10 billion cubic meters of water to fields.

TAKHIATASH GRES PROGRESS REPORT

[Editorial Report] Tashkent SOVET OZBEKISTONI in Uzbek on 12 June 1985 carries on page 2 a 200-word item from UzTAG entitled "The Station's Capability Is Increasing," which reports that work continues on the fifth stage of the Takhiatash GRES which provides Khorezm Oblast, Karakalpakistan, and Tashavuz Oblast of the Turkmen SSR with 2 billion kilowatt hours electric energy annually. When the stage is commissioned next year the station's capability will be increased by another 210,000 kilowatt hours.

CSO: 1836/402

NON-NUCLEAR POWER

BRIEFS

PROBLEMS AT ROGUNSKAYA GES--A general analysis of the status of construction indicates that the weakest link in its organization is the erection of underground structures. Everyone who evaluates the state of affairs at construction of the Rogunskaya GES comes to this conclusion. And the reproach is addressed mostly to the All-Union Association Gidropetsstroy, whose history contains many brilliant pages. From 1977 to the present time, only about 5 km of tunnel have been made at the project and less than 10 percent of all the quarrying has been performed. The penetration speed along the upper shelf did not exceed 24 meters per month and averages only 15, versus the norm of 30 meters per month. The picture is similar at the lower shelf. Only about a third of the work needed for crossing the Vakhsha has been done yet. This year's plan is not being carried out for the Rogunskaya section of GSS [Gidropetsstroy]: about 13-14 million of the planned 19.6 million rubles will be assimilated. The collective is simply not in any condition to double its forces and to assimilate about 1.6 million rubles per month. V. N. Syursyura, chief engineer of the Tallin Administration, considers that during the fourth quarter it will be possible to come up to 1½ million rubles, if only....And the reservations start. There are many problems. Let us name them, in the words of the chief engineer: the rhythmic delivery of sulfate-resistant cement has not been fine-tuned; the concrete activity of Rogungestroy, which provides the drillers with concrete, is poor and unreliable; there is a severe housing shortage at the site; and there are no regular roads to the site. [A. Pal] [Excerpts] [Dushanbe KOMMUNIST TADZHIKISTANA in Russian 1 Aug 85 p 2] 11409

SHAMKHORSKAYA GES PROGRESS REPORTED--Shamkhor--The Shamkhorskaya GES's first turbine is generating power again after the recent successful repair. In the course of the work, the brigades of Miri Mirkhasyyev and Raviliy Kasumov rebuilt one of the important components of the aggregate--the lubrication system--in accordance with a scheme they developed. Owing to this, the consumption of materials has been reduced and, moreover, the unit is now operating in an optimal regime. This year a noteworthy event occurred at the station: the one-and-a-half billionth kWh of electricity since the day of startup was generated. The power engineers are getting economical consumption of water while generating electricity, thanks to which the water level of the Shamkhorskaya "sea" is rising steadily, coming close to the designed grade level. It is planned to reach two important goals here before the [27th CPSU] Congress opens: generate the 2-billionth kWh of energy, and build the "sea" up to its designed water capacity--2.750 million cubic meters. (Azerinform [Azerbaijan Information Agency]) [Excerpts] [Baku MOLODEZH AZER-BAYDZHANA in Russian 23 Jul 85 p 2] 11409

GUSINOOZERSK MINERS SUPPORT GRES--Each year Gusinoozersk's miners mine more than 3 million tons of coal. Their chief customer has been the Gusinoozerskaya GRES, whose four power units have generated about 28 billion kWh of electricity since initial startup. [Excerpt] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 23 Jul 85 p 2] 11409

KYZYLKUM 110-KV POWER LINE--A 110-kV electric-power line that stretches for tens of kilometers along the Kyzylkum desert has gone into operation. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 32, Aug 85 p 3] 11409

GES CONSTRUCTION PROGRESS--Erection of the tenth and last unit at the Sayano-Shushenskaya GES, the country's largest, has started. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 33, Aug 85 p 3] Armenian SSR--Construction of the high-head Spandaryanskaya GES has entered the concluding stage. It will be the prime station of the cascade that is being built on the stormy Vorotan River. Erectors of the All-Union Spetsgidroenergmontazh [Trust for the Erection of Special Power-Engineering Equipment] are assembling the large units, which arrived here by mountain road. The hydropower complex was created in the south of the republic--in the mountainous Zangezour. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 33, Aug 85 p 3] 11409

ZAVOLZHSKAYA TETS TURBOGENERATOR--Ulyanovsk--Volgoenergmontazh [Trust for the Erection of Power-Engineering Equipment in the Volga Economic Region] specialists are erecting ahead of schedule the turbogenerator of the first power unit of TETs-2 in the city's Zavolzhskiy Rayon. The builders and power-engineering workers have committed themselves to introducing the power unit into operation at the end of the current five-year plan. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 32, Aug 85 p 7] 11409

KONAKOVSKAYA GRES OBLIGATIONS--Blue-collar workers, engineers, technicians and white-collar workers of the Konakovskaya GRES are carrying out the five-year plan task ahead of time--by 28 December this year--in regard to the main technical and economic indicators. The Konakovskaya power workers adopted the following commitments for 1986-1990. Provide a reliable power supply for customers during the 12th Five-Year Plan and increase electrical generation by at least 400 million kWh above the control figure through better utilization of the capacity of the existing power units. Save 35,000 tons of firebox mazut (8,000 tons of it in 1986) above the established task, and obtain 1 million rubles of profit by reducing prime costs for generating the electricity. Operate on saved fuel on the day that the 27th CPSU Congress opens. Attributing special importance to raising the reliability of the power supply for the national economy, maintain a high organizational and technical level in preparing the power equipment for operation during the forthcoming fall-and-winter period. During the five-year period, rebuild the startup systems and individual components of power units, modernize systems for monitoring and controlling operating processes, using microprocessors, thus enabling increased operating flexibility of the power units in the optimal mode, and reduce by 2 million kWh the standard consumption of electricity for the power station's in-house needs. Execute a set of measures for improving the repair service for the main and auxiliary power-unit equipment. By raising the quality of repair work, double the operating service life of turbine-regeneration systems. [Excerpts] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 11 Aug 85 p 1] 11409

SAYANO-SHUSHENSKAYA'S LAST UNIT--Krasnoyarsk--Installation of the last unit, the tenth, has started at the Sayano-Shushenskaya GES, the country's largest. It originally was planned that power be obtained from the ninth turbine by the end of the five-year plan. The builders studied critically the remarks directed to them at the CPSU Central Committee meeting on questions of accelerating scientific and technical progress, and they renewed their socialist commitments. The work schedule has been compressed. It has been decided to put the tenth unit into operation before the end of the year. "Turnover of the station for operation is possible only with simultaneous introduction of the Maynskaya GES," said chief of Spetsgidroenergomontazh [Special Administration for the Erection of Power-Engineering Equipment] N. Zatovskiy. "Although its capacity is only one-third of one machine at Sayano-Shushenskaya, this station has been charged with the important job of regulating the reservoir level. However, it is precisely at Mayn that a delay has been noted in the work of the builders, who simultaneously have not provided a work front for the installers. The whole assembly line has been interrupted. We shall be able to make up the missed time and introduce the tenth unit into operation only if work at all stages of construction is organized with precision. The terms of the brigade contract, which were set at the start of the year, have been reviewed: tasks were formulated for working simultaneously at the two sites. The complicated work of attaching the runner to the shaft of the tenth turbine was the decisive test. Using their own effective device, the installers joined the components twice as fast as usual. This 200-ton 'link' has already been installed in the pit in accordance with the new schedule." [Text] [TASS correspondent Yu. Khots] [Moscow IZVESTIYA in Russian 9 Aug 85 p 1] 11409

TURKMEN RURAL POWER LINE--The power supply for the Charshanga virgin-soil tract on the right bank of the Amurdarya has been improved. A multikilometer LEP-110 [110-kV power line] and a power substation have been erected here. With the introduction of these power-engineering installations, a potential has appeared for greatly increasing the supply of electricity to the field camps and livestock departments of farms and for connecting up the most remote enterprises of Charshanga's agricultural industry to the state power system. (Turkmeninform [Turkmen Information Agency]) [Excerpt] [Ashkhabad TURKMENSKAYA ISKRA in Russian 21 Jul 85 p 2] 11409

SAYANO-SHUSHENSKAYA OPERATING IMPROVEMENTS--Sayanogorsk--Efficiency experts of the Sayano-Shushenskaya GES undertook a commitment at the start of the five-year plan period to introduce so many improvements that they would produce a million rubles of economic benefit in 5 years. It would seem that the goal was unattainable, for the hydropower station had been built in accordance with the latest word in domestic science and technology. But the experts still found ways to improve the equipment's design and to raise the quality of its servicing and repair. Just one innovative method for preventing sediments in the generators' water-cooling system here has given 154,000 rubles of savings. The inventors and efficiency experts have already put their millionth ruble into the money box. [V. Sbitnev] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 13 Aug 85 p 1] 11409

NARYN CASCADE'S SPECIAL CONSTRUCTION--The fifth GES of the Naryn cascade--the Tash-Kumyrskaya GES--is special. Much of it is being erected here by unusual methods. For example, for the first time, the station's building, with three units, will be "dry land"; it will be built not in the river bed but on the

shore. This will give freedom of maneuver. Today the construction workers are readying for startup of the station's first power unit. They have undertaken a commitment to turn it over ahead of time--by Power Engineers' Day. [Excerpt] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 13 Aug 85 p 1] 11409

KAZAKH RURAL POWER LINE--Semipalatinsk--The power supply for livestock departments and for sections of the livestock-breeding Sovkhoz imeni Telman, which is located in the spurs of the Chingistau, has become more economical and reliable. The 40-kilometer Sarzhal-Aydapkele power-transmission line, which provides cheap energy for the large sheep-breeding farm, has been placed under an industrial load. Electrification of the villages, including those of the Central Asian type, of Semipalatinsk's Irtysh region is being speeded up. (KazTAG [Kazakh Information Agency]) [Excerpts] [Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 9 Aug 85 p 1] 11409

CSO: 1822/336

ENERGY CONSERVATION

NEW EFFORT TO MEASURE INDUSTRIAL FLOW OF OIL PRODUCTS

Moscow NEFTYANIK in Russian No 6, Jun 85 pp 8-9

[Article by D. Tsagareli and O. Nikitin of USSR Goskomnefteprodukt [State Committee for Supply of Petroleum Products]: "Improvement of Metrological Support for the USSR Goskomnefteprodukt System"]

[Excerpt] It is planned to establish during the 12th Five-Year Plan universal flowmeter check complexes for the checking and repair of meters for liquids under conditions that are close to operational.

In connection with the CPSU Central Committee and USSR Council of Ministers decree, "Raising the Utilization Effectiveness of Motor Transport Equipment in the National Economy, Intensifying the Drive Against Inflated Reports in the Hauling of Freight by Motor Transport, and Providing for the Preservation of Fuels and Lubricants," the Ministry of Instrument Making, Automation Equipment and Control Systems is engaged in developments to meet USSR Goskomnefteprodukt's technical requirements for:

- an installation for automated bottom dispensing of light petroleum product into automotive tankers;
- an automated system for weighing petroleum product in vertical tanks; and
- an automated system for measuring the level in horizontal tanks (surface and subsurface).

Experimental models of the indicated installations and systems should be fabricated and tested this year.

Moreover, a program has been made up for developing and organizing series production of 14 designated instruments and means of automation for automating the recording of the quantity and quality of petroleum product. The program has been approved by Ministry of Petroleum Refining and Petrochemical Industry, Ministry of Instrument Making, Automation Equipment and Control Systems and USSR Goskomnefteprodukt.

The functions of prime developer of integrated modular installations for determining amounts of crude and petroleum product and manufacturing the measuring equipment and the instrumentation for these installations have been

vested in the Ministry of Instrument Making, Automation Equipment and Control Systems, and the functions of supplier for the indicated installations are the Ministry of Oil Industry and the USSR State Committee for Supply of Petroleum Product.

Five sets of the modular installations will be manufactured in 1986, 205 during the next whole five-year plan period.

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ENERGY CONSERVATION

SURVEY OF DEMAND IN JUNE FOR ENERGY RESOURCES

Electric Power Demand

Moscow EKONOMICHESKAYA GAZETA in Russian No 30, Jul 85 p 6

[Article by V. Loginov: "How Fuel and Power Resources Are Used--Electricity"]

[Text] June turned out to be the best month from the point of view of effectiveness of the work to save electricity. According to current Gosenergonadzor [State Inspectorate for Industrial Power Engineering and Power Engineering Supervision] data, for the first time this year the consumption of electricity in all Union republics, without exception, proved to be lower than the allocated ceilings or the ceilings that correspond thereto. Total savings exceeded 1.3 million kWh.

The number of oblasts that exceeded the prescribed limits was greatly reduced. However, still not everywhere has power-consumption discipline been strictly observed. Overconsumption occurred in Kiev, Fergana, Minsk, Kustanay, Turgay, Kursk, Chelyabinsk, Kurgan, Amur and Chita oblasts.

As for the industrial ministries, all of them, except for Minudobreniya [Ministry of Fertilizer], stayed within the allocated ceilings.

Unfortunately, the savings achieved in June proved to be inadequate to compensate for overconsumption of electricity committed in preceding months in the Ukraine, Uzbekistan, Latvia, Georgia, Moldavia, Kirzhiziya and Estonia. For the first half year as a whole, Uzbekistan's and Latvia's arrears in electricity greatly exceeded the amount of savings obtained in June.

Checks on the state of affairs that were conducted in June by Gosenergonadzor organs revealed serious deficiencies, both in the work to save electricity and in work to prepare for the winter in some Kazakhstan oblasts. For example, in Aktyubinsk and Ural oblasts the specific electrical consumption norms and the goals for saving electricity did not reach the kolkhozes and sovkhozes, remaining in the rayon organizations. In such cases, even the strict demand to fulfill these norms and meet these goals was absent.

As experience indicates, deficiencies in heat supply inevitably involve increased consumption of the electricity used for heating during the winter, which, naturally, was not envisioned by any plans and creates additional

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difficulties. This can be avoided only by rigid saving of electricity and the simultaneous preparation of households for the winter.

Natural Gas Demand

Moscow EKONOMICHESKAYA GAZETA in Russian No 30, Jul 85 p 6

[Article by V. Tikhonov: "How Fuel and Power Resources Are Used--Natural Gas"]

[Text] The gas industry coped successfully with plan tasks and socialist commitments for the first half of the year in regard to extraction and deliveries of fuel to the national economy. During the first 6 months of the year 4.4 billion additional cubic meters of gas were recovered, enabling the goal for building up reserves thereof in underground storage to be overfulfilled.

Thanks to the reduction everywhere of the consumption of fuel and power resources and the assiduous use thereof, total savings of gas for June exceeded 600 million cubic meters. The best results here were attained in the Uzbek, Georgian, Lithuanian, Latvian and Estonian SSR's, where savings exceeded the daily ceiling for gas consumption. Thrifty use of the fuel enabled these Union republics, as well as the RSFSR and the Kazakh, Belorussian, Kirghiz and Tadjik SSR's to reduce gas consumption in the first half of 1985 below the allocated amounts.

At the same time, the Ukrainian, Armenian, Moldavian, Azerbaijan and Turkmen SSR's allowed overconsumption of gas that was equal to one or several days' consumption ceilings, according to the results for the first half of the year. During the second half these republics must do additional work to reduce gas consumption, in order not only to compensate for overconsumption since the start of the year but also to fulfill the commitments on savings.

The creation of those conditions for fuel use by consumers under which each enterprise and each production section and brigade should have concrete consumption norms and goals for savings and would be able to account for the consumption of fuel and power resources is important. This obvious requirement still has not by far become the rule everywhere. As a result, despite the overall favorable indicators for use of gas ceilings, a number of ministries seriously violated the observance of gas-consumption discipline. Even during the period of reduced load, excessive gas consumption continues at many USSR Ministroy Materialov [Ministry of Construction Materials Industry] plants, USSR Minenergo [Ministry of Power and Electrification] power stations and enterprises of a number of other ministries.

It is important to lay the basis, right now, in the summer, for the most effective use of gas in the winter.

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GENERAL

TRANSPORT LOSSES AFFECT SUPPLY OF COAL TO VARIOUS INDUSTRIES

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 17 Jul 85 p 3

[Editorial Report] Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 17 July 1985 carries on page 3 a 700-word editorial under the rubric "Assessing the Preparations for the Winter" which warns that industrial supplies of coal and furnace fuel oil are accumulating at a slower rate than during the previous year. Coal supplies at ferrous metallurgy enterprises are currently below the level of last year's supplies by two-fifths, supplies at construction materials factories are down by 29 percent and at thermal electric power stations, by 16 percent compared to last year's level at the beginning of July. The situation for fuel oil, the editorial states, is somewhat better, although factories of the chemical industry have stored supplies at one-third below last year's level and light industry has fallen short thus far by one-fourth. The editorial, disparaging recent criticisms of miners and oil-processors, finds fault with the transport system, particularly the inefficient utilization of railcars, which are said to be held up due to overloads.

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